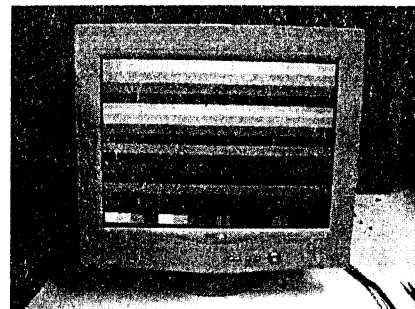


Service



DDC/Power saving/TCO

201P CM25+ GSIII



201P 10/00(PHILIPS)-Version 2

Service Manual

Horizontal frequencies
30 - 121kHz

Table of Contents

Description	Page	Description	Page
Important Safety Notice	2	Block Diagram.....	30
Technical Data.	3	Terminal(A1) Schematic Diagram & PCB (A1)...31	
Regulatory Information.....	4	Video(A2) Schematic Diagram	32
Installation.....	5	Video PCB (A2).....	33
Resolution Modes.....	6	Key Control Schematic Diagram & PCB (E).....	34
OSD Adjustment	7~15	Deflection(B) Schematic Diagram.....	35
OSD Lock & Unlock,Service Mode,Burn In Mode.	16	Deflection & Power PCB (B, C).....	36
Warning and Notes	17	Power Schematic Diagram (C) & MHR (F).....	37
DDC DATA.....	18	Driver(D) Schematic Diagram & PCB (D).....	38
DDC Instructions.....	19~22	Repair Tips	39
Electrical Adjustments	23~25	Exploded View.....	40
Mechanical Instructions	26	Recommended Parts List.....	41
Purity and Static convergence Adjustments	27	Spare Parts List.....	42~49
Safety Test Requirements (Hipot & Ground)	28	General Product Specification.....	50~81
Wiring Diagram	29	Repair flow chart.....	82~89

REFER TO BACK COVER FOR IMPORTANT SAFETY GUIDELINES

SAFETY NOTICE

ANY PERSON ATTEMPTING TO SERVICE THIS CHASSIS MUST FAMILIARIZE HIMSELF WITH THE CHASSIS AND BE AWARE OF THE NECESSARY SAFETY PRECAUTIONS TO BE USED WHEN SERVICING ELECTRONIC EQUIPMENT CONTAINING HIGH VOLTAGES.

CAUTION: USE A SEPARATE ISOLATION TRANSFORMER FOR THIS UNIT WHEN SERVICING.

飛利浦



PHILIPS

TELEVISION/MONITOR SAFETY GUIDELINES FOR THE PROFESSIONAL SERVICE TECHNICIAN

Safety Checks

After the original service problem has been corrected, a complete safety check should be made. Be sure to check over the entire set, not just the areas where you have worked. Some previous service may have left an unsafe condition, which could be unknowingly passed on to your customer. Be sure to check all of the following:

Fire and Shock Hazard

1. Be sure all components are positioned in such a way as to avoid the possibility of adjacent component shorts. This is especially important on those chassis which are transported to and from the service shop.
2. Never release a repaired unit unless all protective devices such as insulators, barriers, covers, strain reliefs, and other hardware have been installed in accordance with the original design.
3. Soldering and wiring must be inspected to locate possible cold solder joints, solder splashes, sharp solder points, frayed leads, pinched leads, or damaged insulation (including the ac cord). Be certain to remove loose solder balls and all other loose foreign particles.
4. Check across-the-line components and other components for physical evidence of damage or deterioration and replace if necessary. Follow original layout, lead length, and dress.
5. No lead or component should touch a receiving tube or a resistor rated at 1 watt or more. Lead tension around protruding metal surfaces or edges must be avoided.
6. Critical components having special safety characteristics are identified with an asterisk (*) in the parts list and enclosed within a broken line* (where several critical components are grouped in one area) along with the safety symbols on the schematic diagrams and/or exploded views.
7. When servicing any unit, always use a separate isolation transformer for the chassis. Failure to use a separate isolation transformer may expose you to possible shock hazard, and may cause damage to servicing instruments.
8. Many electronic products use a polarized ac line cord (one wide pin on the plug). Defeating this safety feature may create a potential hazard to the service and the user. Extension cords which do not incorporate the polarizing feature should never be used.
9. After reassembly of the unit, always perform a leakage test or resistance test from the line cord to all exposed metal parts of the cabinet. Also check all metal control shafts (with knobs removed), antenna terminals, handles, screws, etc. to be sure the unit may be safely operated without danger of electrical shock.

* Broken line

Implosion

1. All picture tubes used in current model receivers are equipped with an integral implosion system. Care should always be used, and safety glasses worn, whenever handling any picture tube. Avoid scratching or other abuse damaging the picture tube during installation.
2. Use only replacement tubes specified by the manufacturer.

X-radiation

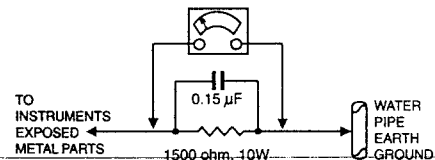
1. Be sure procedures and instructions to all your service personnel cover the subject of X-radiation. Potential sources of X-rays in TV receivers are the picture tube and the high voltage circuits. The basic precaution which must be exercised is to keep the high voltage at the factory recommended level.
2. To avoid possible exposure to X-radiation and electrical shock, only the manufacturer's specified anode connectors must be used.
3. It is essential that the service technician has an accurate HV meter available at all times. The calibration of this meter should be checked periodically against a reference standard.
4. When the HV circuitry is operating properly there is no possibility of an X-radiation problem. High voltage should always be kept at the manufacturer's rated value no higher for optimum performance. Every time a color set is serviced, the brightness should be run up and down while monitoring the HV with a meter to be certain that the HV is regulated correctly and does not exceed the specified value. We suggest that you and your technicians review test procedures so that HV regulation are always checked as a standard servicing procedure, and the reason for this prudent routine is clearly understood by everyone. It is important to use an accurate and reliable HV meter. It is recommended that the HV recorded on each customer's invoice, which will demonstrate a proper concern for the customer's safety.
5. When troubleshooting and making test measurements in a receiver with a problem of excessive high voltage, reduce the line voltage by means of a Variac to bring the HV into acceptable limits while troubleshooting. Do not operate the chassis longer than necessary to locate the cause of the excessive HV.

WARNING: Before removing the CRT anode cap, turn the unit OFF and short the HIGH VOLTAGE to the CRT DAG ground.
SERVICE NOTE: The CRT DAG is not at chassis ground.

6. New picture tubes are specifically designed to withstand higher operating voltages without creating undesirable X-radiation. It is strongly recommended that any shop test fixture which is to be used with the new higher voltage chassis be equipped with one of the new type tubes designed for this service. Addition of a permanently connected HV meter to the shop test fixture is advisable. The CRT types used in these new sets should never be replaced with any other types, as this may result in excessive X-radiation.
7. It is essential to use the specified picture tube to avoid a possible X-radiation problem.
8. Most TV receivers contain some type of emergency "Hold Down" circuit to prevent HV from rising to excessive levels in the presence of a failure mode. These various circuits should be understood by all technicians servicing them, especially since many hold down circuits are inoperative as long as the receiver performs normally.

Leakage Current Cold Check

1. Unplug the ac line cord and connect a jumper between the two prongs of the plug.
2. Turn on the power switch.
3. Measure the resistance value between the jumpered ac plug and all exposed cabinet parts of the receiver, such as screw heads, antennas, and control shafts. When the exposed metallic part has a return path to the chassis, the reading should be between 1 megohm and 5.2 megohms. When the exposed metal does not have a return path to the chassis, the reading must be infinity. Remove the jumper from the ac line cord.



Leakage Current Hot Check

1. Do not use an isolation transformer for this test. Plug the completely reassembled receiver directly into the ac outlet.
2. Connect a 1.5k, 10w resistor paralleled by a 0.15µf. capacitor between each exposed metallic cabinet part and a good earth ground such as a water pipe, as shown above.
3. Use an ac voltmeter with at least 5000 ohms/volt sensitivity to measure the potential across the resistor.
4. The potential at any point should not exceed 0.75 volts. A leakage current tester may be used to make this test; leakage current must not exceed 0.5 milliamperes. If a measurement is outside of the specified limits, there is a possibility of shock hazard. The receiver should be repaired and rechecked before returning it to the customer.
5. Repeat the above procedure with the ac plug reversed. (Note: An ac adapter is necessary when a polarized plug is used. Do not defeat the polarizing feature of the plug.)

Picture Tube Replacement

The primary source of X-radiation in this television receiver is the picture tube. The picture tube utilized in this chassis is specially constructed to limit X-radiation emissions. For continued X-radiation protection, the replacement tube must be the same type as the original, including suffix letter, or a Philips approved tube.

Parts Replacement

Many electrical and mechanical parts in Philips television sets have special safety related characteristics. These characteristics are often not evident from visual inspection nor can the protection afforded by them necessarily be obtained by using replacement components rated for higher voltage, wattage, etc. The use of a substitute part which does not have the same safety characteristics as the Philips recommended replacement part shown in this service manual may create shock, fire, or other hazards.

Proper service and repair is important to the safe, reliable operation of all Philips Consumer Electronics Company** Equipment. The service procedures recommended by Philips and described in this service manual are effective methods of performing service operations. Some of these service operations require the use of tools specially designed for the purpose. The special tools should be used when and as recommended.

TO ENSURE THE CONTINUED RELIABILITY OF THIS PRODUCT, USE ONLY ORIGINAL MANUFACTURER'S REPLACEMENT PARTS, WHICH ARE LISTED WITH THEIR PART NUMBERS IN THE PARTS LIST SECTION OF THIS SERVICE MANUAL.

It is important to note that this manual contains various CAUTIONS and NOTICES which should be carefully read in order to minimize the risk of personal injury to service personnel. The possibility exists that improper service methods may damage the equipment. It also is important to understand that these CAUTIONS and NOTICES ARE NOT EXHAUSTIVE. Philips could not possibly know, evaluate and advise the service trade of all conceivable ways in which service might be done or of the possible hazardous consequences of each way. Consequently, Philips has not undertaken any such broad evaluation. Accordingly, a servicer who uses a service procedure or tool which is not recommended by Philips must first satisfy himself thoroughly that neither his safety nor the safe operation of the equipment will be jeopardized by the service method selected.

** Hereafter throughout this manual, Philips Consumer Electronics Company will be referred to as Philips.

WARNING

Critical components having special safety characteristics are identified with a ▲ by the Ref. No. in the parts list and enclosed within a broken line* (where several critical components are grouped in one area) along with the safety symbol ▲ on the schematics or exploded views.

Use of substitute replacement parts which do not have the same specified safety characteristics may create shock, fire, or other hazards.

Under no circumstances should the original design be modified or altered without written permission from Philips. Philips assumes no liability, express or implied, arising out of any unauthorized modification of design. Servicer assumes all liability.

* Broken Line — — — — —

Technical Specification*

CRT

Size and deflection : 21 inch/51cm,90°deflection angle
Pitch of the Aperture grille : Approx. 0.24 mm

Tube type : Aperture grille, flat, high contrast, anti-static, anti reflection, light transmission 40 %

Phosphor : B22

Recommended display area : 392 x 294 mm

Maximum display area : 406.1 x 304.6 mm

Scanning

Horizontal scanning : 30 - 121 KHz
Vertical scanning : 50 - 160 Hz

Video

Video dot rate : 320 Mhz

Input impedance

-Video : 75 Ohm

- Sync : 2.2 kOhm

Input signal levels

Separate sync

Sync input signal : Composite sync

Sync polarities : Positive / negative

White Color Temperature

Chromaticity CIE coordinates:

at 9300 °K x = 0.283 y = 0.297

6500 °K x = 0.313 y = 0.329

5500 °K x = 0.332 y = 0.347

Physical Specifications

Dimensions : 501(W)x501.8(H)x465.8(D)mm

weight : 26 Kg

Power supply : 90 - 264 VAC, 47-63 HZ

Operating condition

Temperature : 0 °C - 35 °C

Relative Humidity : 10 % - 90 % (W/O Condensation)

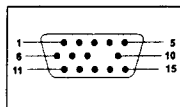
Storage condition

Temperature : - 40 °C - 60 °C

Relative Humidity : 5 % - 95 % (W/O Condensation)

Pin assignment :

The 15-pin D-sub connector(male) of the signal cable (IBM systems) :



Pin No.	Assignment	Pin No.	Assignment
1	Red video input	9	No pin
2	Green video input	10	Sync ground
3	Blue video input	11	Identification output - Connected to pin 10
4	Identification output - Connected to pin 10	12	Serial data line(SDA)
5	Ground	13	H.Sync /H+V
6	Red video ground	14	V.Sync(VCLK for DDC)
7	Green video ground	15	Data clock line(SCL)
8	Blue video ground		

Automatic Power Saving

If you have VESA's DPMS compliance display card or software installed in your PC, the monitor can automatically reduce its power consumption when not in use. And if an input from a keyboard, mouse or other input devices is detected, the monitor will automatically "wake up". The following table shows the power consumption and signalling of this automatic power saving features :

Power Management Definition						
VESA's mode	VIDEO	H-SYNC	V-SYNC	POWER USED <small>(Typical 100 W)</small>	POWER SAVING (%)	LED COLOR
ON	Active	Yes	Yes	< 15 W	0 %	Green
Stand-by	Blanked	No	Yes	< 15 W	89 %	Yellow
Suspend	Blanked	Yes	No	< 15 W	89 %	Yellow
OFF	Blanked	No	No	< 3 W	98 %	Amber

This monitor is Energy Star® compliant. As an ENERGY STAR® Partner, PHILIPS has determined that this product meets the ENERGY STAR® guidelines for energy efficiency.

Regulatory Information

TCO'92 and TCO '99 Information

Why do we have environmentally labeled computers?

In many countries, environmental labeling has become an established method for encouraging the adaptation of goods and services to the environment. The main problem, as far as computers and other electronics equipment are concerned, is that environmentally harmful substances are used both in the products and during their manufacture. Since it is not so far possible to satisfactorily recycle the majority of electronics equipment, most of these potentially damaging substances sooner or later enter nature.

There are also other characteristics of a computer, such as energy consumption levels, that are important from the viewpoints of both the work (internal) and natural (external) environments. Since all methods of electricity generation have a negative effect on the environment (e.g. acidic and climate-influencing emissions, radioactive waste), it is vital to save energy. Electronics equipment in offices is often left running continuously and thereby consumes a lot of energy.

What does labeling involve?

This product meets the requirements for the TCO'99 scheme which provides for international and environmental labeling of personal computers. The labeling scheme was developed as a joint effort by the TCO (The Swedish Confederation of Professional Employees), Svenska Naturskyddsforeningen (The Swedish Society for Nature Conservation) and Statens Energimyndighet (The Swedish National Energy Administration).

Approval requirements cover a wide range of issues: environment, ergonomics, usability, emission of electric and magnetic fields, energy consumption and electrical and fire safety.

The environmental demands impose restrictions on the presence and use of heavy metals, brominated and chlorinated flame retardants, CFCs (freons) and chlorinated solvents, among other things. The product must be prepared for recycling and the manufacturer is obliged to have an environmental policy which must be adhered to in each country where the company implements its operational policy.

The energy requirements include a demand that the computer and/or display, after a certain period of inactivity, shall reduce its power consumption to a lower level in one or more stages. The length of time to reactivate the computer shall be reasonable for the user.

Labeled products must meet strict environmental demands, for example, in respect of the reduction of electric and magnetic fields, physical and visual ergonomics and good usability.

Below you will find a brief summary of the environmental requirements met by this product. The complete environmental criteria document may be ordered from:

Environmental Requirements

Flame retardants

Flame retardants are present in printed circuit boards, cables, wires, casings and housings. Their purpose is to prevent, or at least to delay the spread of fire. Up to 30% of the plastic in a computer casing can consist of flame retardant substances. Most flame retardants contain bromine or chloride, and those flame retardants are chemically related to another group of environmental toxins, PCBs. Both the flame retardants containing bromine or chloride and the PCBs are suspected of giving rise to severe health effects, including reproductive damage in fish-eating birds and mammals, due to the bio-accumulative* processes. Flame retardants have been found in human blood and researchers fear that disturbances in fetus development may occur.

The relevant TCO'99 demand requires that plastic components weighing more than 25 grams must not contain flame retardants with organically bound bromine or chlorine. Flame retardants are allowed in the printed circuit boards since no substitutes are available.

Cadmium**

Cadmium is present in rechargeable batteries and in the color-generating layers of certain computer displays. Cadmium damages the nervous system and is toxic in high doses. The relevant TCO'99 requirement states that batteries, the color-generating layers of display screens and the electrical or electronics components must not contain any cadmium.

Mercury**

Mercury is sometimes found in batteries, relays and switches. It damages the nervous system and is toxic in high doses. The relevant TCO'99 requirement states that batteries may not contain any mercury. It also demands that mercury is not present in any of the electrical or electronics components associated with the labeled unit.

CFCs (freons)

The relevant TCO'99 requirement states that neither CFCs nor HCFCs may be used during the manufacture and assembly of the product. CFCs (freons) are sometimes used for washing printed circuit boards. CFCs break down ozone and thereby damage the ozone layer in the stratosphere, causing increased reception on earth of ultraviolet light with increased risks e.g. skin cancer (malignant melanoma) as a consequence.

Lead**

Lead can be found in picture tubes, display screens, solders and capacitors. Lead damages the nervous system and in higher doses, causes lead poisoning. The relevant TCO'99 requirement permits the inclusion of lead since no replacement has yet been developed.

* Bio-accumulative is defined as substances which accumulate within living organisms.

** Lead, Cadmium and Mercury are heavy metals which are bio-accumulative.

Energy Star Declaration

This monitor is equipped with a function for saving energy which supports the VESA Display Power Management Signaling (DPMS) standard. This means that the monitor must be connected to a computer which supports VESA DPMS to fulfill the requirements in the NUTEK specification 803299/94. Time settings are adjusted from the system unit by software. From indicated inactivity to Power Saving Position A2, the total time must not be set to more than 70 minutes. NUTEK

Federal Communications Commission (FCC) Notice (U.S. Only)

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Use only RF shielded cable that was supplied with the monitor when connecting this monitor to a computer device.

To prevent damage which may result in fire or shock hazard, do not expose this appliance to rain or excessive moisture.

THIS CLASS B DIGITAL APPARATUS MEETS ALL REQUIREMENTS OF THE CANADIAN INTERFERENCE-CAUSING EQUIPMENT REGULATIONS.

Installation

201P GS3 CM25 5

Go to cover page

6 201P GS3 CM25

Go to cover page

Data Storage(Resolution Modes)

Factory preset modes:

This monitor has 39 factory-preset modes as indicated in the following table:

Mode	Resolution	Frequency		Sync. polarity	
		H(KHz)	V(Hz)	H	V
1	640 X 350	31.469 KHz/70.067Hz	-	+	-
2	640 X 480	31.469KHz/59.941 Hz	-	-	-
3	720 X 400	31.468KHz/70.084 Hz	-	-	+
4	640 X 480	37.5 KHz/75Hz	-	-	-
5	640 X 480	37.861 KHz/72.810 Hz	-	-	-
6	640 X 350	37.861 KHz/85.081 Hz	+	+	-
7	800 X 600	37.878 KHz/60.317 Hz	+	+	+
8	720 X 400	37.927 KHz/85.039 Hz	-	-	+
9	640 X 480	43.269 KHz/85.008 Hz	-	-	-
10	800 X 600	46.875 KHz/75.000 Hz	+	+	+
11	800 X 600	48.077 KHz/72.188 Hz	+	+	+
12	1024 X 768	48.363KHz/60.004Hz	-	-	-
13	832 X 624	49.722 KHz/74.546Hz	+	+	+
14	640 X 480	50.628 KHz/100.10 Hz	-	-	-
15	800 X 600	53.674 KHz/85.061 Hz	+	+	+
16	1024 X 768	56.478 KHz/70.069 Hz	-	-	-
17	1280 X 960	60.000 KHz/60.000 Hz	+	+	+
18	1024 X 768	60.023KHz/75.029Hz	+	+	+
19	800 X 600	63.923 KHz/100.00 Hz	+	+	+
20	1280 X 1024	63.981KHz/60.020Hz	+	+	+
21	1152 X 864	67.500 KHz/75.000 Hz	+	+	+
22	1024 X 768	68.677KHz/84.997Hz	+	+	+
23	1152 X 870	68.681KHz/74.979Hz	-	-	-
24	1152 X 900	71.809KHz/76.15Hz	+	+	+
25	1600 X 1200	75.000 KHz/60.000 Hz	+	+	+
26	1280 X 1024	79.976KHz/75.024Hz	+	+	+
27	1600 X 1200	81.250 KHz/65.000 Hz	+	+	+
28	1792X 1344	83.640 KHz/59.999 Hz	+	+	+
29	1280 X 960	85.938 KHz/85.002 Hz	+	+	+
30	1856X 1392	86.333 KHz/59.995 Hz	+	+	+
31	1600 X 1200	87.500 KHz/70.000 Hz	+	+	+
32	1920X 1440	90.000 KHz/60.000 Hz	+	+	+
33	1280 X 1024	91.148KHz/85.024Hz	+	+	+
34	1600 X 1200	93.750KHz/75.000Hz	+	+	+
35	1600 X 1200	106.250KHz/85.000Hz	+	+	+
36	1792 X 1344	106.270 KHz/74.997 Hz	+	+	+
37	2048 X 1536	95.820 KHz/60.000 Hz	+	+	+
38	1920 X 1440	112.50 KHz/75.000 Hz	+	+	+
39	2048 X 1536	120.45 KHz/75.000 Hz	+	+	+

OSD Adjustment

On-Screen Display

Description of the On-Screen Display The OSD Tree The OSD Controls

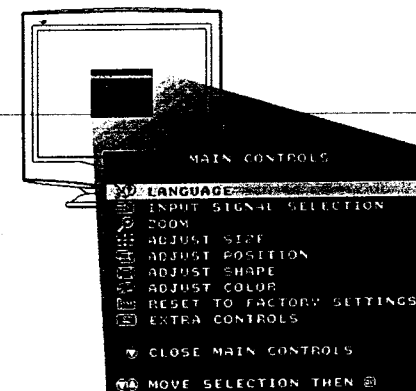
Description of the On Screen Display

What is the On-Screen Display?

This is a feature in all Philips monitors which allows an end-user to adjust screen performance of monitors directly through an on-screen instruction window. The user interface provides user-friendliness and ease-of-use when operating the monitor.

Basic and simple instruction on the control keys.

On the front controls of your monitor, once you press the **OK** button, the On Screen Display (OSD) Main Controls window will pop up and you can now start making adjustments to your monitor's various features. Use the **UP** or **DOWN** keys to make your adjustments within.

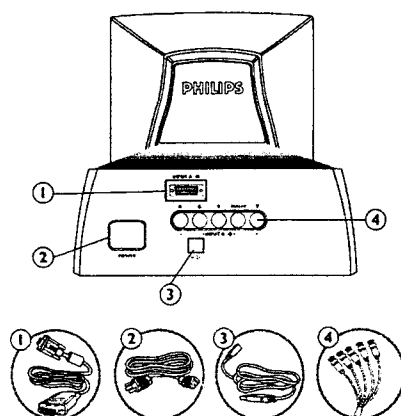
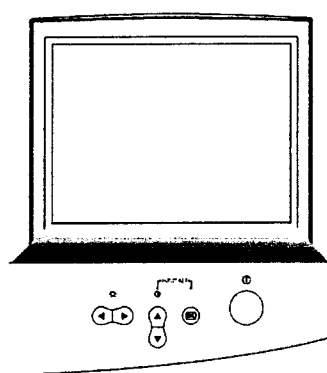


The OSD Tree

Below is an overall view of the structure of the On-Screen Display. You can use this as reference when you want to later on work your way around the different adjustments.

Front View

Rear View



- Power button switches your monitor on.
- OK button which when pressed will take you to the OSD controls
- Contrast hotkey. When the UP arrow is pressed, the adjustment controls for the CONTRAST will show up.
- UP and DOWN buttons are used when adjusting the OSD of your monitor
- Brightness hotkey. When both the LEFT and RIGHT arrows are pressed at the same time, then the adjustment controls for BRIGHTNESS will show up.
- LEFT and RIGHT buttons, like the UP and DOWN buttons, are also used in adjusting the OSD of your monitor.
- By pressing both the UP and OK buttons, you can easily access the Input Signals A and/or B.

- 1. D-Sub Port - Attach the D-Sub connector that comes with your monitor here. Other end connects to your PC.
- 2. Power in - Attach power cable here.
- 3. USB Port - Attach your USB Upstream cable here. Connect the other end to your USB hub or your PC's USB connector.
- 4. BNC Connectors - Attach the connectors here to get the best video performance from your monitor

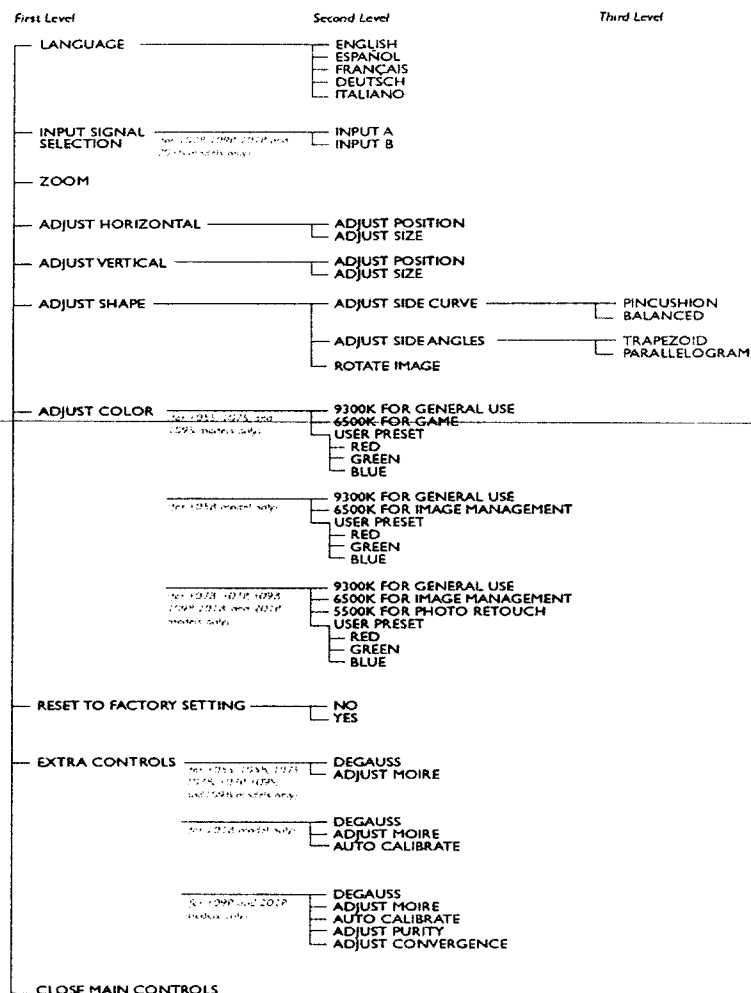
OSD menu tree structure

201P GS3 CM25 7

Go to cover page

The OSD Tree

Below is an overall view of the structure of the On-Screen Display. You can use this as reference when you want to later on work your way around the different adjustments.



Back

Forward

OSD Adjustments

8 201P GS3 CM25

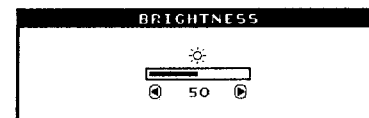
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The OSD Controls

BRIGHTNESS

To adjust your screen's brightness, follow the steps below. Brightness is the overall intensity of the light coming from the screen. A 50% brightness is recommended.

- 1) Press the \leftarrow or \rightarrow button on the monitor. The BRIGHTNESS window appears.



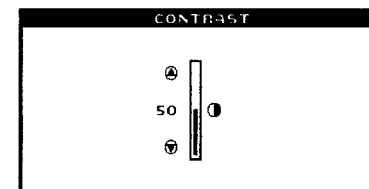
- 2) Press the \leftarrow or \rightarrow button to adjust the brightness.
- 3) When the brightness is adjusted to the level desired, stop pressing the \leftarrow or \rightarrow button and after three seconds the BRIGHTNESS window will disappear with the new adjustment saved.

Smart Help After the BRIGHTNESS window has disappeared, to continue to the CONTRAST window, follow the steps under CONTRAST.

CONTRAST

To adjust your screen's contrast, follow the steps below. Contrast is the difference between the light and dark areas on the screen. A 100% contrast is recommended.

- 1) Press the \leftarrow or \rightarrow button on the monitor. The CONTRAST window appears.



- 2) Press the \leftarrow or \rightarrow button to adjust the contrast.
- 3) When the contrast is adjusted to the level desired, stop pressing the \leftarrow or \rightarrow button and after three seconds the CONTRAST window will disappear with the new adjustment saved.

Smart Help After the CONTRAST window has disappeared, to continue to the MAIN CONTROLS, follow the steps under LANGUAGE

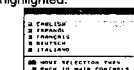
LANGUAGE

The ON SCREEN DISPLAY shows its settings in one of five languages. The default is English, but you can select French, Spanish, German, or Italian.

- 1) Press the \rightarrow button on the monitor. The MAIN CONTROLS window appears. LANGUAGE should be highlighted.
- 2) Press the \leftarrow button again. The LANGUAGE window appears.



- 3) Press the \leftarrow or \rightarrow button until the desired language is highlighted.



- 4) Press the \rightarrow button to confirm your selection and return to MAIN CONTROLS window. CLOSE MAIN CONTROLS will be highlighted...

Smart Help After returning to MAIN CONTROLS...

... to continue to INPUT SIGNAL SELECTION, press the \leftarrow button until INPUT SIGNAL SELECTION is highlighted. Next, follow steps 3 - 5 under INPUT SIGNAL SELECTION.

... to exit completely, press the \rightarrow button

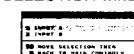
INPUT SIGNAL SELECTION

INPUT SIGNAL SELECTION determines what you see on the screen. The default setting is INPUT A, but if the video input signal is different that the output signal, you may want to change it to INPUT B.

- 1) Press the \rightarrow button on the monitor. The MAIN CONTROLS window appears.
- 2) Press the \leftarrow button until INPUT SIGNAL SELECTION is highlighted.



- 3) Press the \rightarrow button. The INPUT SIGNAL SELECTION window appears.



- 4) Press the \leftarrow or \rightarrow button to highlight INPUT B or INPUT A.

- 5) Press the \rightarrow button to confirm your selection and return to the MAIN CONTROLS window. CLOSE MAIN CONTROLS will be highlighted.

Smart Help After returning to MAIN CONTROLS...

... to continue to ZOOM, press the \rightarrow button until ZOOM is highlighted. Next, follow steps 3 - 5 under ZOOM.

... to exit completely, press the \rightarrow button

Back

Forward

OSD Adjustments

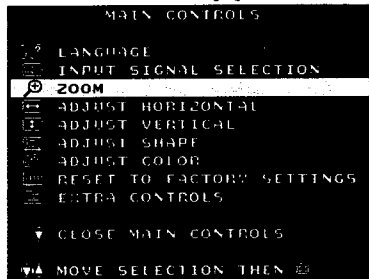
201P GS3 CM25 9

Go to cover page

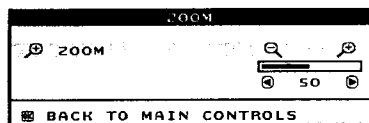
ZOOM

ZOOM increases or decreases the size of the images on your screen. To adjust the ZOOM follow the steps below.

- 1) Press the **■** button on the monitor. The MAIN CONTROLS window appears.
- 2) Press the **■** button until ZOOM is highlighted.



- 3) Press the **■** button. The ZOOM window appears.



- 4) Press the **◀** or **▶** button to adjust ZOOM.
- 5) Press the **■** button to confirm your selection and return to the MAIN CONTROLS window. CLOSE MAIN CONTROLS will be highlighted.

Smart Help After returning to MAIN CONTROLS...

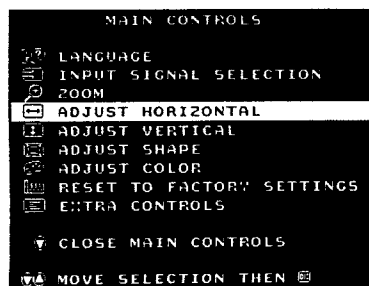
... to continue to ADJUST HORIZONTAL, press the **■** button until ADJUST HORIZONTAL is highlighted. Next, follow steps 3 - 7 under ADJUST HORIZONTAL.

... to exit completely, press the **■** button

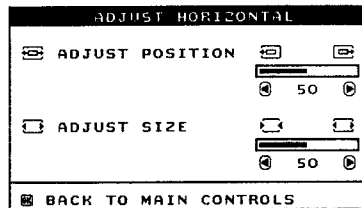
ADJUST HORIZONTAL

ADJUST POSITION under ADJUST HORIZONTAL shifts the image on your screen either to the left or right. Use this feature if your image does not appear centered. ADJUST SIZE under ADJUST HORIZONTAL expands or controls the image on your screen, pushing it out toward the left and right sides or pulling it in toward the center.

- 1) Press the **■** button on the monitor. The MAIN CONTROLS window appears.
- 2) Press the **■** button until ADJUST HORIZONTAL is highlighted.

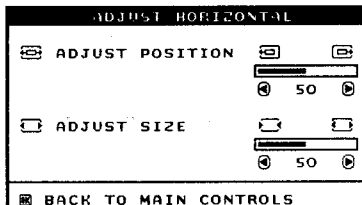


- 3) Press the **■** button. The ADJUST HORIZONTAL window appears. ADJUST POSITION should be highlighted.



- 4) Press the **◀** or **▶** button to move the image to the left or right.

- 5) When the position is adjusted, press the **■** button to return to MAIN CONTROLS window, or press the **■** to highlight ADJUST SIZE.



- 6) To adjust the horizontal size, press the **◀** or **▶** button.
- 7) When the size is adjusted, press the **■** button to return to MAIN CONTROLS window. CLOSE MAIN CONTROLS will be highlighted.

Smart Help After returning to MAIN CONTROLS...

... to continue to ADJUST VERTICAL, press the **■** button until ADJUST VERTICAL is highlighted. Next, start with step 3 under ADJUST VERTICAL and follow the directions.

... to exit completely, press the **■** button

ADJUST VERTICAL

ADJUST POSITION under ADJUST VERTICAL shifts the image on your screen either up or down. Use this feature if your image does not appear centered. ADJUST SIZE under ADJUST VERTICAL expands or controls the image on your screen, pushing it out toward the top or bottom or pulling it in toward the center.

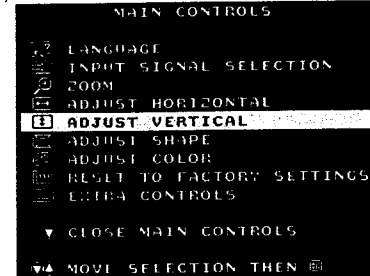
- 1) Press the **■** button on the monitor. The MAIN CONTROLS window appears.

10 201P GS3 CM25

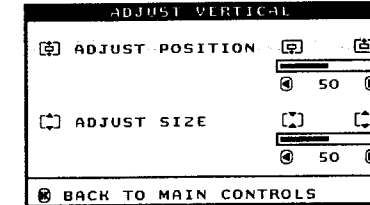
Go to cover page

OSD Adjustments

- 2) Press the **■** button until ADJUST VERTICAL is highlighted.

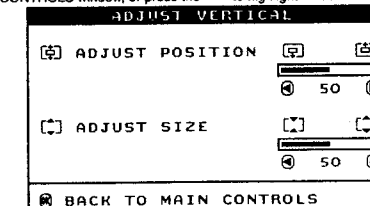


- 3) Press the **■** button. The ADJUST VERTICAL window appears. ADJUST POSITION should be highlighted.



- 4) Press the **▲** or **▼** button to move the image up or down.

- 5) When the position is adjusted, press the **■** button to return to MAIN CONTROLS window, or press the **■** to highlight ADJUST SIZE.



- 6) To adjust the vertical size, press the **▲** or **▼** button.

- 7) When the size is adjusted, press the **■** button to return to MAIN CONTROLS window. CLOSE MAIN CONTROLS will be highlighted.

Smart Help After returning to MAIN CONTROLS...

... to continue to ADJUST SHAPE, press the **■** button until ADJUST SHAPE is highlighted. Next, start with step 3 under ADJUST SHAPE and follow the directions.

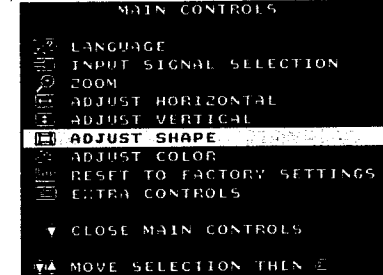
... to exit completely, press the **■** button

ADJUST SHAPE

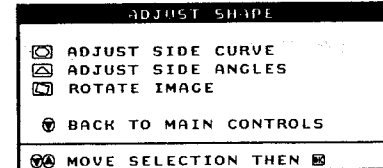
ADJUST SIDE CURVE under ADJUST SHAPE allows you to adjust two of the five preset options. These two options are PINCUSHION and BALANCED pincushion. Note: use these features only when the picture is not square.

- 1) Press the **■** button on the monitor. The MAIN CONTROLS window appears.

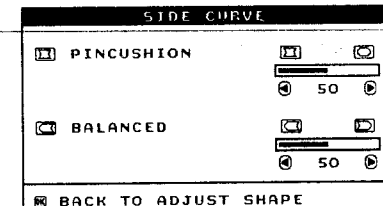
- 2) Press the **■** button until ADJUST SHAPE is highlighted.



- 3) Press the **■** button. The ADJUST SHAPE window appears. ADJUST SIDE CURVE should be highlighted.

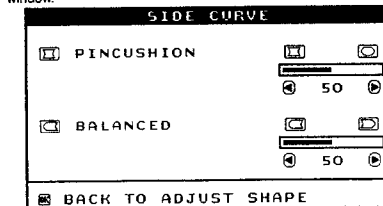


- 4) Press the **■** button. The SIDE CURVE window appears. PINCUSHION should be highlighted.



- 5) To adjust the pincushion, press the **▲** or **▼** button.

- 6) When the pincushion is adjusted, press the **■** button to highlight BALANCED or press the **■** button to return to the ADJUST SHAPE window.



- 7) To adjust the balanced pincushion, press the **■** or **■** button.

- 8) When the balanced pincushion is adjusted, press the **■** button to return to the ADJUST SHAPE window. BACK TO MAIN WINDOWS will be highlighted.

- 9) Press the **■** button to return to the MAIN CONTROLS window, or press the **■** button until ADJUST SIDE ANGLES is highlighted.

Smart Help After returning to MAIN CONTROLS...

...to continue to ADJUST SIDE ANGLES, start with step 5 under ADJUST SIDE ANGLES and follow the directions.

...to exit completely, press the **↵** button twice.

...to adjust only the BALANCED pincushion, follow steps 1 - 4 above, then press the **↵** button, and follow steps 7 - 9.

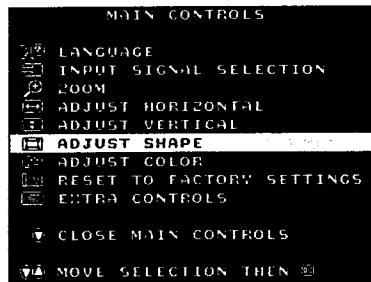
...to adjust only the PARALLELOGRAM, follow steps 1 - 4 above, then press the **↵** button, and follow steps 7 - 9.

ADJUST SIDE ANGLES

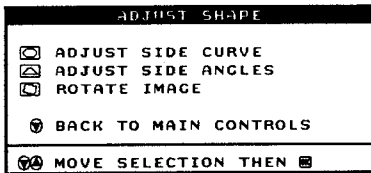
ADJUST SIDE ANGLES under ADJUST SHAPE allows you to adjust two of the five preset options. These two options are TRAPEZOID and PARALLELOGRAM. Note: use these features only when the picture is not square.

1) Press the **↵** button on the monitor. The MAIN CONTROLS window appears.

2) Press the **↵** button until ADJUST SHAPE is highlighted.

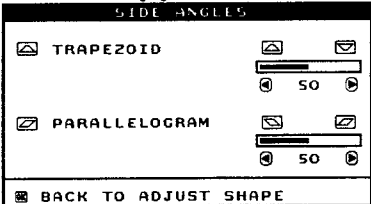


3) Press the **↵** button. The ADJUST SHAPE window appears. ADJUST SIDE CURVE should be highlighted.



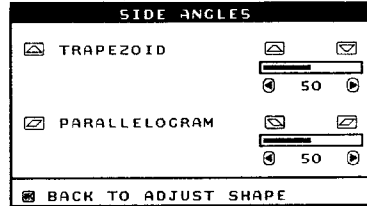
4) Press the **↵** button to highlight ADJUST SIDE ANGLES.

5) Press the **↵** button. The SIDE ANGLES window appears. TRAPEZOID should be highlighted.



6) To adjust the trapezoid, press the **←** or **→** button. SHAPE window.

7) When the trapezoid is adjusted, press the **↵** button to highlight PARALLELOGRAM or press the **↵** button to return to the ADJUST



8) To adjust the parallelogram, press the **←** or **→** button.

9) When the parallelogram is adjusted, press the **↵** button to return to the ADJUST SHAPE window. BACK TO MAIN WINDOWS will be highlighted.

10) Press the **↵** button to return to the MAIN CONTROLS window, or press the **↵** button until ROTATE IMAGE is highlighted.

Smart Help After returning to MAIN CONTROLS...

...to continue to ROTATE IMAGE, start with step 5 under ROTATE IMAGE and follow the directions.

...to exit completely, press the **↵** button twice.

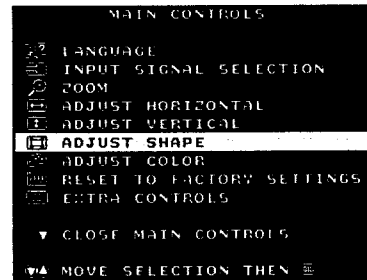
...to adjust only the PARALLELOGRAM, follow steps 1 - 4 above, then press the **↵** button, and follow steps 7 - 9.

ROTATE IMAGE

ROTATE IMAGE under ADJUST SHAPE allows you to adjust one of the five preset options. These two options are PINCUSHION and BALANCED pincushion. Note: use this feature only when the picture is not square.

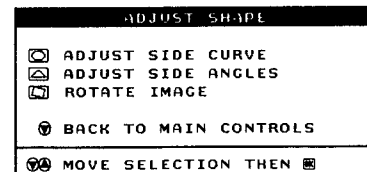
1) Press the **↵** button on the monitor. The MAIN CONTROLS window appears.

2) Press the **↵** button until ADJUST SHAPE is highlighted.



3) Press the **↵** button. The ADJUST SHAPE window appears. ADJUST SIDE CURVE should be highlighted.

4) Press the **↵** button until ROTATE IMAGE is highlighted.



5) Press the **↵** button. The ROTATE IMAGE window appears. ROTATE should be highlighted.



6) To adjust the rotation, press the **←** or **→** button.

7) When the rotation is adjusted, press the **↵** button to return to the ADJUST SHAPE window. BACK TO MAIN CONTROLS should be highlighted.

8) Press the **↵** button to return to MAIN CONTROLS.

Smart Help After returning to MAIN CONTROLS...

...to continue to ADJUST COLOR, press the **↵** button until ADJUST COLOR is highlighted. Next, start with step 3 under ADJUST COLOR and follow the directions.

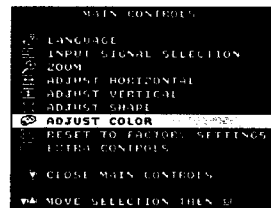
...to exit completely, press the **↵** button twice.

ADJUST COLOR

Your monitor has three preset options you can choose from. The first option is for GENERAL USE, which is fine for most applications. The second option is for IMAGE MANAGEMENT, which includes projects such as desktop publishing, viewing a DVD from your DVD player or pictures on the World Wide Web, and playing video games. The third option is for PHOTO RETOUCH, which is for working with pictures you have imported into your computer and want to alter. When you select one of these options, the monitor automatically adjusts itself to that option. There is also a fourth option, USER PRESET, which allows you to adjust the colors on your screen to a setting you desire.

1) Press the **↵** button on the monitor. The MAIN CONTROLS window appears.

2) Press the **↵** button until ADJUST COLOR is highlighted



3) Press the **↵** button. The ADJUST COLOR window appears.



4) Press the **↵**, or **↵** button to highlight 9300K for GENERAL USE, 6500K for IMAGE MANAGEMENT, 5500K for PHOTO RETOUCH, or USER PRESET.

5) Once you have highlighted GENERAL USE, IMAGE MANAGEMENT, or PHOTO RETOUCH, press the **↵** button to confirm your selection and return to the MAIN CONTROLS window. CLOSE MAIN CONTROLS will be highlighted.



6a) If USER PRESET is highlighted, press the **↵** button to highlight RED. Next, press the LEFT CURSOR or RIGHT CURSOR button to adjust the color red.

6b) When finished with RED, press the **↵** button to highlight GREEN. Next, press the **←** or **→** button to adjust the color green.

6c) When finished GREEN, press the **↵** button to highlight BLUE. Next, press the **←** or **→** button to adjust the color blue.

6d) When all adjustments are complete, press the **↵** button to confirm your adjustments and return to the MAIN CONTROLS window. CLOSE MAIN CONTROLS will be highlighted.

Smart Help After returning to MAIN CONTROLS...

...to continue to RESET TO FACTORY SETTINGS, press the **↵** button until RESET TO FACTORY SETTINGS is highlighted. Next, start with step 3 under RESET TO FACTORY SETTINGS.

...to exit completely, press the **↵** button.

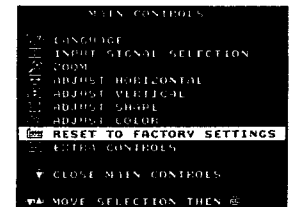
RESET TO FACTORY SETTINGS

RESET TO FACTORY SETTINGS returns everything in all the windows to factory presets.

1) Press the **↵** button on the monitor. The MAIN CONTROLS window appears.

2) Press the **↵** button until RESET TO FACTORY SETTINGS is highlighted.

...to exit completely, press the **↵** button.

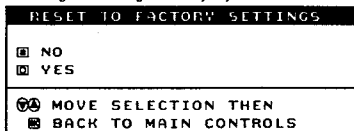


3) Press the **↵** button. The RESET TO FACTORY SETTINGS window appears.

OSD Adjustments (Continued) 201P GS3 CM25 13

Go to cover page

4) Press the \leftarrow or \rightarrow button to select YES or NO. NO is the default. YES returns all settings to their original factory adjustments.



5) Press the \rightarrow button to confirm your selection and return to the MAIN CONTROLS window. CLOSE MAIN CONTROLS will be highlighted.

Smart Help After returning to MAIN CONTROLS...

... to continue to EXTRA CONTROLS, press the \rightarrow button until EXTRA CONTROLS is highlighted. Next, start with step 3 under EXTRA CONTROLS.

... to exit completely, press the \rightarrow button.

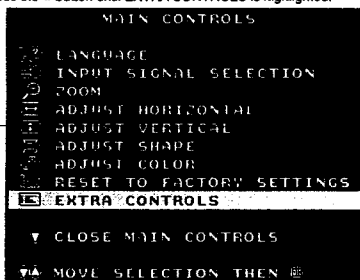
EXTRA CONTROLS

DEGAUSS

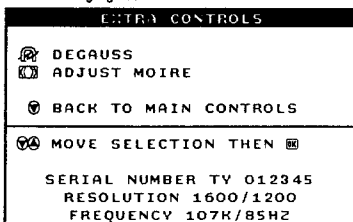
EXTRA CONTROLS is a set of three features, including DEGAUSS. Degaussing removes electromagnetic build up that may distort the color on your screen.

1) Press the \rightarrow button on the monitor. The MAIN CONTROLS window appears.

2) Press the \rightarrow button until EXTRA CONTROLS is highlighted.



3) Press the \rightarrow button. The EXTRA CONTROLS window appears. DEGAUSS will be highlighted.



4) To degauss your screen, press the \rightarrow button. Your screen will be degaussed, then the MAIN CONTROLS window will reappear. CLOSE MAIN CONTROLS will be highlighted.

Smart Help After returning to MAIN CONTROLS...

... to continue to ADJUST MOIRE, press the \rightarrow button until EXTRA CONTROLS is highlighted. Next, start with step 3 under EXTRA CONTROLS, ADJUST MOIRE.

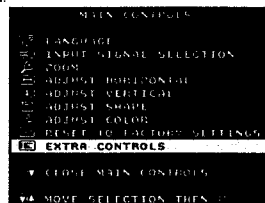
... to exit completely, press the \rightarrow button.

ADJUST MOIRE

EXTRA CONTROLS is a set of three features, including ADJUST MOIRE. Moire is a fringe pattern arising from the interference between two superimposed line patterns. To adjust your moire, follow the steps below. Note: Use only if necessary. By activating ADJUST MOIRE, sharpness can be affected.

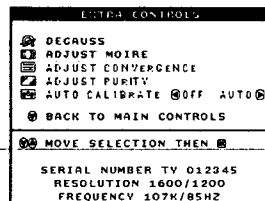
1) Press the \rightarrow button on the monitor. The MAIN CONTROLS window appears.

2) Press the DOWN CURSOR button until EXTRA CONTROLS is highlighted.

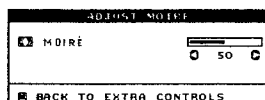


3) Press the \rightarrow button. The EXTRA CONTROLS window appears. DEGAUSS will be highlighted.

4) Press the \rightarrow button until ADJUST MOIRE is highlighted.



5) Press the \rightarrow button. The ADJUST MOIRE window appears. HORIZONTAL will be highlighted.



6) To adjust the horizontal moire, press the \leftarrow or \rightarrow button.

7) When the moire is adjusted, press the \rightarrow button to return to the EXTRA CONTROLS window. BACK TO MAIN CONTROLS will be highlighted.

After returning to MAIN CONTROLS to exit completely, press the \rightarrow button.

14 201P GS3 CM25

Go to cover page

OSD Adjustments (Continued)

ADJUST CONVERGENCE

EXTRA CONTROLS is a set of features, including ADJUST CONVERGENCE. Convergence is a process by which a color is created by blending other colors. For example, white is created by blending red, blue, and green. If these colors do not completely blend together (converge) then you may see unwanted red, green, or blue lines or dots. To adjust the convergence, follow the steps below. Note: Use only if necessary. Remember: you must degauss the monitor BEFORE adjusting the convergence.

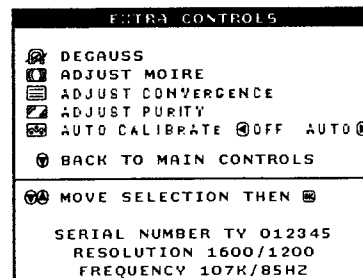
1) Press the \rightarrow button on the monitor. The MAIN CONTROLS window appears.

2) Press the \rightarrow button until EXTRA CONTROLS is highlighted.

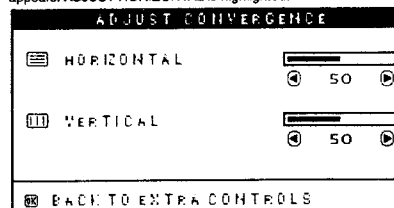


3) Press the \rightarrow button. The EXTRA CONTROLS window appears. DEGAUSS is highlighted. Note: If you have not degaussed the monitor, please follow the steps under the Extra Controls - Degauss section of this manual before adjusting the convergence.

4) Press the \rightarrow button until ADJUST CONVERGENCE is highlighted.

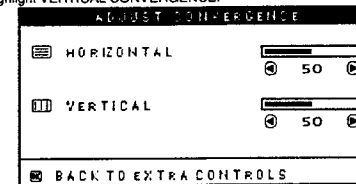


5) Press the \rightarrow button. The ADJUST CONVERGENCE window appears. ADJUST HORIZONTAL is highlighted.



6) To adjust the horizontal convergence, press the \leftarrow or \rightarrow button.

7) When the horizontal convergence is adjusted, press the \rightarrow button to highlight VERTICAL CONVERGENCE.



8) To adjust the vertical convergence, press the \leftarrow or \rightarrow button.

9) When the vertical convergence is adjusted, press the \rightarrow button to

return to the EXTRA CONTROLS window. BACK TO MAIN CONTROLS is highlighted.

Smart Help

After returning to EXTRA CONTROLS...

... to continue to ADJUST PURITY, press the \rightarrow button until ADJUST PURITY is highlighted. Next, start with step 4 under EXTRA CONTROLS - ADJUST PURITY.

Note: If you have not degaussed the monitor, please follow the steps under the Extra Controls - Degauss section of this manual before adjusting the purity.

... to exit completely, press the \rightarrow button twice.

ADJUST PURITY

EXTRA CONTROLS is a set of features, including ADJUST PURITY.

Purity is a process by which colors appear clear and untainted, especially in the four corners of the monitor. Purity can be affected by such things as the presence of a magnetic source near the monitor or even by the ambient room temperature. For example, you might see the color red in a corner of the monitor screen where you should see only a pure white. To adjust the purity, follow the steps below. Note: Use only if necessary. Remember: you must degauss the monitor BEFORE adjusting the purity.

1) Press the \rightarrow button on the monitor. The MAIN CONTROLS window appears.

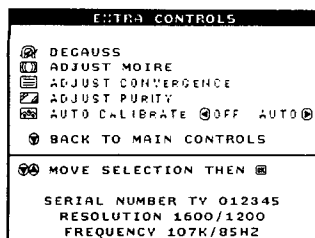
2) Press the \rightarrow button until EXTRA CONTROLS is highlighted.



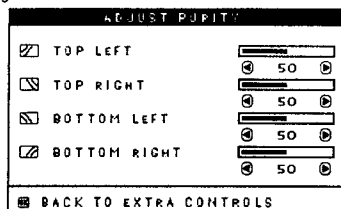
3) Press the \rightarrow button. The EXTRA CONTROLS window appears.

DEGAUSS is highlighted. Note: If you have not degaussed the monitor, please follow the steps under the Extra Controls - Degauss section of this manual before adjusting the purity.

4) Press the \rightarrow button until ADJUST PURITY is highlighted.

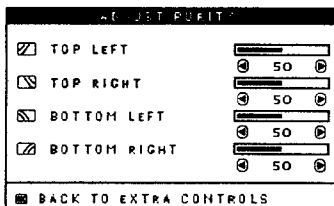


5) Press the . The ADJUST PURITY window appears. TOP LEFT is highlighted.



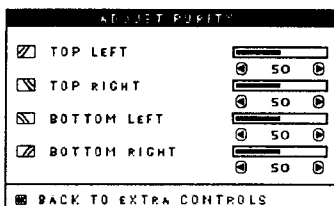
6) To adjust the top left purity, press the or button.

7) When the top left purity is adjusted, press the button to highlight TOP RIGHT.



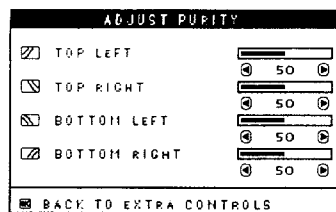
8) To adjust the top right purity, press the or button.

9) When the top right purity is adjusted, press the button to highlight BOTTOM LEFT.



10) To adjust the bottom left purity, press the or button.

11) When the bottom left purity is adjusted, press the button to highlight BOTTOM RIGHT.



12) To adjust the bottom right purity, press the or button.

13) When the bottom right purity is adjusted, press the button

to return to the EXTRA CONTROLS window. BACK TO MAIN CONTROLS is highlighted.

Smart Help
After returning to EXTRA CONTROLS...

... to continue to ADJUST PURITY, press the button until AUTO

CALIBRATE is highlighted. Next, start with step 4 under EXTRA CONTROLS - AUTO CALIBRATE.

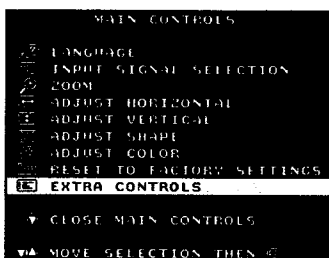
... to exit completely, press the button twice.

AUTO CALIBRATE

EXTRA CONTROLS is a set of three features, including AUTO CALIBRATE. Auto Calibrate regularly readjusts the color to its original value for any of the ADJUST COLOR selections, including USER PRESET. AUTO CALIBRATE also adjusts the luminance and black level of the monitor, so that all three items remain at original settings. This helps extend the useful life of the monitor. The calibration process takes less than 6 seconds to complete.

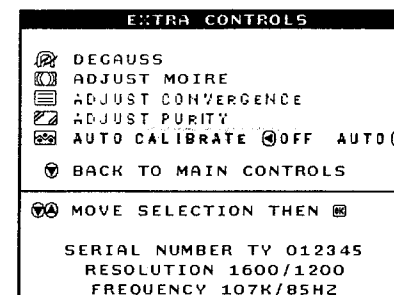
1) Press the button on the monitor. The MAIN CONTROLS window appears.

2) Press the button until EXTRA CONTROLS is highlighted.



3) Press the button. The EXTRA CONTROLS window appears. DEGAUSS will be highlighted.

4) Press the button until AUTO CALIBRATE is highlighted.



5) Press the or button to select OFF or AUTO.

6) When the selection is made, press the button to confirm your selection and return to the MAIN CONTROLS window. CLOSE MAIN WINDOW will be highlighted.

7) Press the button to exit the MAIN CONTROLS window.

Smart Help
After returning to MAIN CONTROLS...

... to exit completely, press the button.

CLOSE MAIN CONTROLS



To lock (disable) OSD function:

- Press OSD button * * for over 15 seconds to lock the OSD function. Release it, then OSD comes on the screen as below.

ATTENTION
CONTROL MENU IS LOCKED

To unlock (enable) OSD function:

- Press OSD button * * for over 10 seconds again to unlock the OSD function. Release it, then OSD comes on the screen as below.

Disable/Enable all the WARNING SIGNAL & Access Service mode (burn in mode):

To disable all the WARNING SIGNAL:

- Disconnect the Interface cable of the monitor (Monitor is ON.).
- Press OSD button * * for over 15 seconds to disable all the WARNING SIGNAL. Then release the "OSD" button.
- If it is successful, then the signal * NO SIGNAL INPUT * disappeared to enter power saving-off mode.

To enable all the WARNING SIGNAL:

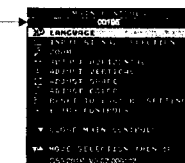
-After disconnect the Interface cable of the monitor, then Monitor is powered ON.

- If it is successful, the signal * NO SIGNAL INPUT * comes on the screen again later.

Access Service Mode & Burn in mode

Firstly, get into Factory Adjustment Mode.

Push LEFT & RIGHT buttons at the same time for over 15 seconds and release them.
The factory message appears at the bottom of the main OSD menu. (for example: GS3 201P V3.07 000107 ; 00195 is M.T.B.F. in HOUR unit)



- Disconnect the Interface cable of the monitor.
- Push LEFT & RIGHT buttons at the same time, then power ON.

- If it is successful, the signal * comes on the screen later. (Background is white.)

Leave "burn in MODE":

- Reconnect the interface cable to PC, then the "burn in MODE" disappear.


Warning and Notes

201P GS3 CM25 17

◀ Go to cover page

1. Safety Instructions for Repairs

1.1 Safety regulations require that during a repair:

- The set should be connected to the mains via an isolating transformer.
- Safety components, indicated by the symbol , should be replaced by components identical to the original ones.
- When replacing the CRT, safety goggles must be worn.

1.2 Safety regulations require also that after a repair:

- The set should be returned in its original condition.
- The cabinet should be checked for defects to avoid touching, by the customer, of inner parts.
- The insulation of the mains lead should be checked for external damage.
- The mains lead strain relief should be checked on its function.
- The cable form and EHT cable are routed correctly and fixed with the mounted cable clamps in order to avoid touching of the CRT, hot components or heat sinks.

* Thermally loaded solder joints should be checked and resoldered where necessary. This includes components like LOT, the line output transistor, fly-back capacitor.

2. Maintenance Instructions

It is recommended to have a maintenance inspection carried out periodically by a qualified service employee. The interval depends on the usage conditions.

- During the maintenance inspection the above mentioned "safety instructions for repair" should be carried out. The power supply and deflection circuitry on the chassis, the CRT panel and the neck of the CRT should be cleaned.

When cleaning the monitor on the outside:

- Always disconnect the monitor from the mains.
 - Always use a damp AND NOT WET lint-free cloth.
 - To clean the screen, apply a household glass cleaner to a cloth and then wipe the screen.
 - Do not use solvents or abrasives on the monitor.
- It might discolour the cabinet and/or affect the anti glare treatment on your screen.

3. Warnings

3.1 In order to prevent damage to ICs and transistors, all high-voltage flash-overs must be avoided. In order to prevent damage to the picture tube, the method shown in Fig 3.1 should be used to discharge the picture tube. Use a high-voltage probe and a multimeter (position DC-V). Discharge until the meter reading is 0V (after approx 30s).

3.2 ESD

All ICs and many other semiconductors are sensitive to electrostatic discharges (ESD). Careless handling during repair can drastically shorten the life. Make sure that during repair you are connected by a pulse band with resistance to the same potential as the earth of the unit. Keep components and tools also at this same potential.

3.3 Be careful when taking measurements in the high-voltage section

and on the picture tube panel.

3.4 Never replace modules or other components while the unit is switched on.

3.5 When making settings, use plastic rather than metal tools. This will prevent any short-circuit and the danger of a circuit becomes unstable.

3.6 After repair the wiring should be fastened once more in the cable clamps for this purpose.

3.7 Together with the deflection unit the picture tube is used as an integrated unit. Adjustment of this unit during repair is therefore not recommended.

4. Notes

The semiconductors indicated in the circuit diagram(s) and in the parts lists are completely interchangeable per position with the semiconductors in the unit, irrespective of the type indication on these semiconductors.

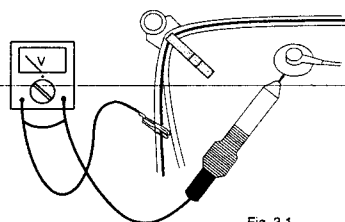


Fig. 3.1

18 201P GS3 CM25

◀ Go to cover page

..... MITSUBISHI GS3.chk	
Vendor/Product Identification	
ID Manufacturer Name	: PHL
ID Product Code	: 221A(HEX.)
ID Serial Number	: 123456(DEC.)
Week of Manufacture	: 39
Year of Manufacture	: 1999
EDID Version, Revision	
Version	: 1
Revision	: 2
Basic Display Parameters/Features	
Video Input Definition	: Analog Video Input 0.700V/0.000V (0.70Vpp) without Blank-to-Black Setup Separate Sync Composite Sync without Sync on Green no Serration required
Maximum H Image Size	: 41 cm
Maximum V Image Size	: 30 cm
Display Transfer Characteristic:	2.72 (gamma)
Feature Support (DPMS)	: Standby Suspend Active Off
Display Type	: RGB color display
Color Characteristics	
Red X coordinate	: 0.622
Red Y coordinate	: 0.339
Green X coordinate	: 0.279
Green Y coordinate	: 0.6
Blue X coordinate	: 0.149
Blue Y coordinate	: 0.072
White X coordinate	: 0.283
White Y coordinate	: 0.297
Established Timings	
Established Timings I	: 720 x 400 @70Hz (VGA,IBM) 720 x 400 @88Hz (XGA2,IBM) 640 x 480 @60Hz (VGA,IBM) 640 x 480 @72Hz (VESA) 640 x 480 @75Hz (VESA) 800 x 600 @60Hz (VESA) 800 x 600 @72Hz (VESA) 800 x 600 @75Hz (VESA) 832 x 624 @75Hz (Mac II) 1024 x 768 @60Hz (VESA) 1024 x 768 @70Hz (VESA) 1024 x 768 @75Hz (VESA) 1280 x 1024 @75Hz (VESA) 1152 x 870 @75Hz (Mac II)
Established timings II	
Manufacturer's timings	
Standard Timing Identification #1	
Horizontal active pixels	: 1920
Aspect Ratio	: 4:3
Refresh Rate	: 60
Standard Timing Identification #2	
Horizontal active pixels	: 1792
Aspect Ratio	: 4:3
Refresh Rate	: 75
Standard Timing Identification #3	
Horizontal active pixels	: 1600
Aspect Ratio	: 4:3
Refresh Rate	: 75
Standard Timing Identification #4	
Horizontal active pixels	: 1280
Aspect Ratio	: 5:4
Refresh Rate	: 85
Standard Timing Identification #5	
Horizontal active pixels	: 1280
Aspect Ratio	: 5:4
Refresh Rate	: 60

DDC DATA

Standard Timing Identification #6	
Horizontal active pixels	: 1024
Aspect Ratio	: 4:3
Refresh Rate	: 85
Detailed Timing #1	
Pixel Clock (MHz)	: 319.92
H Active (pixels)	: 2048
H Blanking (pixels)	: 608
V Active (lines)	: 1536
V Blanking (lines)	: 70
H Sync Offset (F Porch) (pixels)	: 64
H Sync Pulse Width (pixels)	: 216
V Sync Offset (F Porch) (lines)	: 1
V Sync Pulse Width (lines)	: 3
H Image Size (mm)	: 392
V Image Size (mm)	: 294
H Border (pixels)	: 0
V Border (lines)	: 0
Flags	: Non-interlaced Normal Display, No stereo Digital Separate Sync Positive V Sync Positive H Sync
Monitor Descriptor #2	
Serial Number	: TY 123456
Monitor Descriptor #3	
Monitor Name	: Philips 201P
Monitor Descriptor #4	
Min. Vt rate Hz	: 50
Max. Vt rate Hz	: 160
Min. Horiz. rate kHz	: 30
Max. Horiz. rate kHz	: 121
Max. Supported Pixel	: Not specified
Extension Flag	
	: 0
Check sum	
	: 81(hex)
..... EDID data for Mitsubishi CRT	
0: 00 1: ff 2: ff 3: ff 4: ff 5: ff 6: ff 7: 00 8: 41 9: 0c 10: 1a 11: 22 12: 40 13: e2 14: 01 15: 00 16: 27 17: 09 18: 01 19: 02 20: 6c 21: 29 22: 1e 23: ac 24: e9 25: 7a 26: 68 27: 9f 28: 56 29: 47 30: 99 31: 26 32: 12 33: 48 34: 4c 35: ff 36: ff 37: 80 38: d1 39: 4f 40: c1 41: 4f 42: a9 43: 4f 44: 81 45: 99 46: 81 47: 80 48: 61 49: 59 50: 45 51: 59 52: a9 53: 59 54: ff 55: 7c 56: 00 57: 60 58: 82 59: 00 60: 46 61: 60 62: 40 63: d8 64: 13 65: 00 66: 88 67: 26 68: 11 69: 00 70: 00 71: 1e 72: 00 73: 00 74: 00 75: ff 76: 00 77: 20 78: 54 79: 59 80: 20 81: 20 82: 31 83: 32 84: 33 85: 34 86: 35 87: 36 88: 0a 89: 20 90: 00 91: 00 92: 00 93: fc 94: 00 95: 50 96: 48 97: 49 98: 4c 99: 49 100: 50 101: 53 102: 20 103: 32 104: 30 105: 31 106: 50 107: 0a 108: 00 109: 00 110: 00 111: fd 112: 00 113: 32 114: a0 115: 1e 116: 79 117: ff 118: 00 119: 0a 120: 20 121: 20 122: 20 123: 20 124: 20 125: 20 126: 00 127: 81	

◀ Back

Forward ▶

◀ Back

Forward ▶

DDC Instructions

201P GS3 CM25 19

◀ Go to cover page

There are two chips (IC) to store the serial number of monitor as below.

DDC IC (with EDID data)
OSD IC (EEPROM)

To write the serial number of monitor to DDC IC and OSD IC simultaneously.
Please follow the indications as below.

- Access the factory mode of monitor.
- Execute DDCV2A F0.EXE
- Follow DDC instructions to write serial number to DDC IC and OSD IC.
- Turn off monitor (leave factory mode).
- Press OSD button, select MONITOR STATUS, verify the updated serial number of monitor.

To access factory mode:

- Turn off monitor (don't turn off PC)
- Hold * and * simultaneously on the front control panel, then press *, wait till the OSD menu with characters * factory mode (below OSD menu) * come on the screen of monitor as shown in Fig. 1.
- If OSD menu disappears on the screen of monitor, press * again (anytime), then the OSD menu comes on the screen again.
- using *, *, *: to select OSD menu.

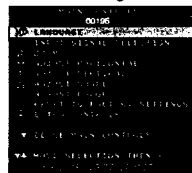
*, *, *: to increase or decrease the setting.

- Using * to confirm the selection.

To leave factory mode

- * After alignment of factory mode, turn off monitor (if you do not turn off monitor, the OSD menu is always at the factory mode), then turn on monitor again (at this moment, the OSD menu goes back to user mode).

Fig 1



DDC Instructions

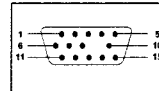
This [DDC Module (DDC cable)= 4822 320 12004(=4822 724 27550)] and [DDC V2(DDCV2A .EXE) software(3.5" disk)=3138 106 10065] are used for "BU Monitor - Chungli product range" which incorporates a DDC1/DDC2B function that allows bi-directional communication between the monitor and PC system for optimal video configuration.
[January 31 2000, Revision 3.3], which upgrades the software and service information(4822 727 21027 & 4822 727 21038), is fully compatible with previous one (DDCV2A F0.EXE).

Additional information :

Additional information about DDC (Display Data Channel) may be obtained from Video Electronics Standards Association (VESA).
Extended Display Identification (EDID) information may be also obtained from VESA.

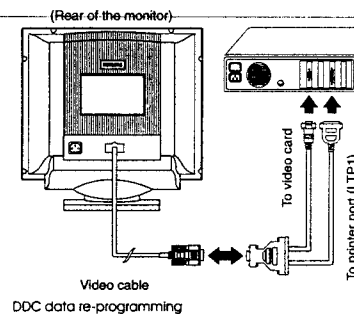
Pin assignment

The 15-pin D-sub connector (male) of the signal cable (3 rows) for DDC feature :



Pin No.	Assignment	Pin No.	Assignment
1	Red video input	9	No pin
2	Green video input	10	Logic ground
3	Blue video input	11	Connected to pin 10
4	Connected to pin 10	12	Serial data line (SDA)
5	Ground	13	H.sync/H+V
6	Red video ground	14	V. sync (VCLK for DDC)
7	Green video ground		
8	Blue video ground	15	Data clock line(SCL)

Connection



1. General

In case the DDC data memory IC, replaced due to a defect the data contents of this IC have to be re-programmed via a PC. In case of replacement of the video (or deflection) board it is advised to re-soldered DDC IC from the old board onto the new board, in this case the IC dose not need to be re-programmed.

2. DDCV2A.EXE can be used for :

EDID Structure Version/Revision			
Version	: 1		
Revision	: 0	(text file)	
and			
Version	: 1		
Revision	: 2	(.hex file)	

20 201P GS3 CM25

DDC Instructions (Continued)

◀ Go to cover page

DDC Reprogramming Instructions (for PHILIPS models)

System Requirements

DDC Module (DDC cable), P/N = 4822 320 12004
An Intel 386 (or above) PC or compatible
DOS 6.0 or above
DDCV2A.EXE software

Procedure

Connect DDC Cable between PC and Monitor.
Turn on Monitor and PC.
Access Factory Mode of monitor.
Verify Factory Mode by OSD function of monitor.
Insert diskette in Drive a: Select Run "DDCV2A F0(Zero).EXE" under DOS or Win. (hit the space bar "once")

Verify the data and version of DDC application software.
It should be : January 31 2000
Revision 3.3

Press "Enter" at the introduction screen

Menu Configuration:

File	R/W	Setup	Quit
Load EDID	Write EDID to EEPROM	Options	
Load txt file (V1.0)	Read From EEPROM	Barcode format	
Save EDID	Edit EDID Code		
Save txt File	Auto Scan		
Convert EDID Code			
Os shell			
Exit			

General :

1. How to change drive

- Use arrow keys to highlight "Options" under the Setup menu, press "Enter".
- Press "F2", then press "ESC", fill in "A" or "C".
[[If your .HEX files for different Model numbers in drive "A", then fill in "A".
(If your .HEX files for different Model numbers in drive "C", then fill in "C").
Normally, to read DDC data from EEPROM of Monitor is enough.]
- Press "Enter", then press "ESC"

2. How to select .HEX files for different Model numbers example:

- Use arrow keys to highlight "Load EDID" under the File menu, press "Enter"
- Bring up PHILIPS press "Enter"
- Bring up .A 201P GSIII ← select, press "Enter"
- Bring up .A at this highlight area, press "Enter", then go back to last screen
00MITS.HEX ←select for 201P10/00(MITS CRT)

How to write DDC hex files to Monitor

- Use arrow keys to highlight "Options" under the Setup menu, press "Enter"
- Tab down to ID Serial Number, use down arrow key to place the asterisk (*) beside "store in DEC with LSB first". Press "control/enter" to save.
(Ensure the top asterisk (*) is beside in store in HEX with LSB first.)
- Use arrow keys to highlight "Load EDID" under the file menu, press "Enter".
- Use arrow keys to highlight "PHILIPS", Press "Enter".
- Use arrow keys to highlight "the model list under subdirect", press "Enter".
- Use arrow keys to highlight "Write EDID to EEPROM" under the R/W menu, press "Enter".
- Use arrow keys to highlight "Read from EEPROM" under the R/W menu, press "Enter".
- Use arrow keys to highlight "Edit EDID Code" under the R/W menu, press "Enter".
- Verify the ID Serial number on the screen matches the serial number of the unit.
- Verify EDID Structure Version is "Version .2, Revision .1"
- Press "ESC"
- Use arrow keys to highlight "Quit", Press "Enter".

Menu Configuration:

File	R/W	Setup	Quit
Load EDID	Write EDID to EEPROM	Options	
Load txt file (V1.0)	Read From EEPROM	Barcode format	
Save EDID	Edit EDID Code		
Save txt File	Auto Scan		
Convert EDID Code			
Os shell			
Exit			

◀ Back

Forward ▶

◀ Back

Forward ▶

DDC Instructions (Continued)

201P GS3 CM25 21

Go to cover page

How to change the Year, Week & Serial number of Monitor [for PHILIPS(BRANDED) models]

① Use arrow keys to highlight "Barcode format", under the Setup menu, press "Enter".

② Bring up : Barcode example : 9925123456
Barcode format : YYWWSSSSSS

← Fill in 9925123456, press "Enter"
← Fill in YYWWSSSSSS, press "Enter"

③ continued:

Barcode example	: 9925123456
Barcode format	: YYWWSSSSSS
Manufacture Year	: 1999
Manufacture Week	: 25
Serial No.	: 123456
Serial No. ASCII	: TY 123456
EDID [16] Week	: 19
EDID [17] Year	: 09 [Year-1990]
EDID [12..15]	: 0001e240
EDID [77-89]	: TY
data correct ? (Y/N) Y	

Factory code for each site is as below.

Brazil H C (48h,43h)
Chungli T Y (54h,59h)
Delta G K(47h,4Bh)
Juarez Y A(59h,41h)
Shenzshen C X(43h,58h)
Suzhou BZ (42h,5Ah)
Szombathely HD (48h,44h)

← Fill in "Y", don't press "Enter"

There is a description at the lower of the screen for Barcode format as below.

Barcode format : Y,W,S,X,- (year,week,s/no,ignore,fixd)

Y stands for "year".
W stands for "week".
S stands for "s/no (serial number)".
X stands for "ignore". Allow user to fill in any 'character' or 'numeric'.
- stands for "fixed". User have to fill in Special 'character' or 'numeric' for "AutoScan" if user fill in '-' at "Barcode format".

④ Use arrow keys to highlight "Auto Scan" under the RW menu, press "Enter".

⑤ Bring up: Auto Scan

Serial Number
Year Code
Week Code
don't care

(If monitor is not at Factory Mode, access Factory Mode at this moment.)

⑥ Fill in "Barcode data (for instance: 9925123456)" beside AutoScan, press "Enter".
After 10 seconds around, bring up:

File	R/W	Setup	Quit
Write EDID to EEPROM			
Read From EEPROM			
Edit EDID Code			
Auto Scan			
Factory writing ...100%	(58) (f8) (7f) (12).		

⑦ Press "ESC" "ESC", return to R/W menu.

⑧ Select "Edit EDID code", press "Enter".

⑨ Verify "ID Serial No."

Turn off monitor, then turn on monitor again.

⑩ Press OSD button, select "MONITOR STATUS", press OSD button again.

⑪ Verify "SERIALNO".

(Leave OSD function).

⑫ Use arrow keys to highlight "QUIT", press "Enter".

Back

Forward

DDC Instructions (Continued)

22 201P GS3 CM25

Go to cover page

How to change the Year, Week & Serial number of Monitor [for PHILIPS(PCEC) models]

① Use arrow keys to highlight "Barcode format", under the Setup menu, press "Enter".

② Bring up : Barcode example : 993412345678
Barcode format : YYWWSSSSSSSS

← Fill in 993412345678, press "Enter"
← Fill in YYWWSSSSSSSS, press "Enter"

③ continued:

Barcode example	: 993412345678
Barcode format	: YYWWSSSSSSSS
Manufacture Year	: 1999
Manufacture Week	: 34
Serial No.	: 12345678
Serial No. ASCII	: TY 12345678
EDID [16] Week	: 22
EDID [17] Year	: 09 [Year-1990]
EDID [12..15]	: 00bc614e
EDID [77-89]	: TY
data correct ? (Y/N) Y	

Factory code for each site is as below.

Brazil H C (48h,43h)
Chungli T Y (54h,59h)
Delta G K(47h,4Bh)
Juarez Y A(59h,41h)
Shenzshen C X(43h,58h)
Suzhou BZ (42h,5Ah)
Szombathely HD (48h,44h)

← Fill in "Y", don't press "Enter"

There is a description at the lower of the screen for Barcode format as below.

Barcode format : Y,W,S,X,- (year,week,s/no,ignore,fixd)

Y stands for "year".
W stands for "week".
S stands for "s/no (serial number)".
X stands for "ignore". Allow user to fill in any 'character' or 'numeric'.
- stands for "fixed". User have to fill in Special 'character' or 'numeric' for "AutoScan" if user fill in '-' at "Barcode format".

④ Use arrow keys to highlight "Auto Scan" under the RW menu, press "Enter".

⑤ Bring up: Auto Scan

Serial Number
Year Code
Week Code
don't care

(If monitor is not at Factory Mode, access Factory Mode at this moment.)

⑥ Fill in "Barcode data (for instance: 993412345678)" beside AutoScan, press "Enter".
After 10 seconds around, bring up:

File	R/W	Setup	Quit
Write EDID to EEPROM			
Read From EEPROM			
Edit EDID Code			
Auto Scan			
Factory writing ...100%	(58) (f8) (7f) (12).		

⑦ Press "ESC" "ESC", return to R/W menu.

⑧ Select "Edit EDID code", press "Enter".

⑨ Verify "ID Serial No."

Turn off monitor, then turn on monitor again.

⑩ Press OSD button, select "MONITOR STATUS", press OSD button again.

⑪ Verify "SERIALNO".

(Leave OSD function).

⑫ Use arrow keys to highlight "QUIT", press "Enter".

Back

Forward

Electrical Adjustments

201P GS3 CM25 23

◀ Go to cover page

0. General

When carry-out the electrical settings in many cases a video signal must be applied to the monitor. A computer with:

- ATI GPT-1600 (4822 397 10065), Mach 64 (up to 107kHz)

are used as the video signal source. The signal patterns are selected from the "service test software" package, see user guide 4822 727 21046 (GPT-1600).

0.1 This monitor has 35 factory-preset modes as below

31.469 KHz/70.087 Hz, 640 X 350	81.250 KHz/65.000 Hz, 1600 X 1200
31.469 KHz/59.941 Hz, 640 X 480	83.640 KHz/59.999 Hz, 1792 X 1344
31.468 KHz/70.084 Hz, 720 X 400	85.938 KHz/85.002 Hz, 1280 X 960
37.5 KHz/75 Hz, 640 X 480	86.333 KHz/59.995 Hz, 1856X 1392
37.861 KHz/72.810 Hz, 640 X 480	87.500 KHz/70.000 Hz, 1600 X 1200
37.861 KHz/85.081 Hz, 640 X 350	90.000 KHz/60.000 Hz, 1920 X 1440
37.879 KHz/60.317 Hz, 800 X 600	91.146 KHz/85.024 Hz, 1280 X 1024
37.927 KHz/85.039 Hz, 720 X 400	93.750 KHz/75.000Hz, 1600 X 1200
43.269 KHz/85.008 Hz, 640 X 480	106.250KHz/85.00 Hz, 1600 X 1200
46.875 KHz/75.000 Hz, 800 X 600	106.270KHz/74.997Hz, 1792 X 1344
48.077 KHz/72.188 Hz, 800 X 600	95.820 KHz/60.000 Hz, 2048 X 1536
48.363 KHz/60.004Hz, 1024X 768	112.50 KHz/75.000 Hz, 1920 X 1440
49.722 KHz/74.546Hz, 932 X 624	120.45 KHz/75.000 Hz, 2048 X 1536
50.628 KHz/70.10 Hz, 640 X 480	
53.674 KHz/85.061 Hz, 800 X 600	
56.476 KHz/70.069 Hz, 1024X 768	
60.000 KHz/60.000 Hz, 1280 X 960	
60.023KHz/75.029Hz, 1024 X 768	
63.923 KHz/100.00 Hz, 800 X 600	
63.981KHz/60.020Hz, 1280 X 1024	
67.500 KHz/75.000Hz, 1152 X 864	
68.677KHz/84.997Hz, 1024 X 768	
68.681KHz/74.979Hz, 1152 X 870	
71.809KHz/76.15 Hz, 1152 X 900	
75.000KHz/60.000 Hz, 1600 X 1200	
79.976KHz/75.024 Hz, 1280 X 1024	

0.2 With normal VGA card:

If not using the ATI card during repair or alignment, The service engineer also can use this service test software adapting with normal standard VGA adaptor and using standard VGA mode 640 x 480, 31.5 kHz/60 Hz (only) as signal source.

0.3 AC/DC Measurement:

The measurements for AC waveform and DC figure is based on 640 x 480 31.5 kHz/60 Hz resolution mode with test pattern "gray scale".

Power input: 110V AC

1. B+ supply voltage (3157) 210Vdc

- Apply a video signal in the 1024 x 768 with 68.7 kHz/85Hz mode.

- Select the "cross-hatch" pattern.

- Set the brightness control and the contrast control to the minimum position.

- Pre-set trimming potentiometer 3157(B+) and 3698(EHT) in mid-position.

- Set Vg2 (screen) to fully Counter-clockwise (zero beamcurrent).

- Connect a dc voltmeter between the joint of capacitor 2131 and ground (common ground).

- Set the B+ trimming potentiometer 3157 so that the reading on the dc voltmeter is 210 V +/- 0.5 Vdc.

2. High-voltage EHT (3698)

- Apply a video signal in the 1024 x 768 with 68.7 kHz/85Hz mode.

- Select the "cross-hatch" pattern.

- Set the brightness control and the contrast control to the minimum position.

- Turn off the power.

- Connect a "high-voltage voltmeter" between the high-voltage connection of the picture tube and earth.
- Turn on the power.
- Set the EHT trimming potentiometer 3698 so that the "high-voltage voltmeter" reads 27.0 kV +/- 0.2 kV.

- Turn off the power.
- Remove the "high-voltage voltmeter" from the picture tube.
- Turn on the power again.

3. Monitor the following auxiliary voltages.

SOURCE ACROSS C2362	+ 8.0V +/- 0.5 VDC
SOURCE ACROSS C2143	+ 5.0V +/- 0.5 VDC
SOURCE ACROSS C2361	+ 12.0V +/- 0.5 VDC
SOURCE ACROSS C2134	+ 15.0V +/- 1.0 VDC
SOURCE ACROSS C2137	+ 15.5V +/- 1.0 VDC
SOURCE ACROSS D6140 *	6.3V +/- 0.5 VDC
SOURCE ACROSS C2131	+ 210.0V +/- 1.5 VDC
SOURCE ACROSS C2133	+ 82.7V +/- 2.0 VDC

4. General conditions for alignment

4.1 During all alignments, supply a distortion free AC mains voltage to set via an isolating transformer with low internal impedance.

4.2 Align in pre-warmed condition, at least 30 minutes warm-up with nominal picture brightness.

4.3 Purity, geometry and subsequent alignments should be carried out in magnetic cage with correct magnetic field.

Northern hemisphere : H=0, V=450+/-50 mG, Z=0
Southern hemisphere : H=0, V=-520+/-50 mG, Z=0
Equatorial Support : H=0, V=0 mG, Z=0

4.4 All voltages are to be measured or applied with respect to ground.

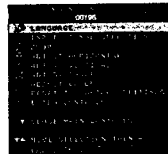
Note: Do not use heatsink as ground.

4.5 Adjust function controls * * * to center position except for contrast control which should be set to MAX.

5. To access factory mode:

- Turn off monitor (don't turn off PC)

- Press * * and * * simultaneously on the front control panel, then press * * , wait till the OSD menu with characters "factory mode (below OSD menu)" come on the screen of monitor.



- If OSD menu disappears on the screen of monitor, press * * again (anytime), then the OSD menu comes on the screen again.

- using * * * : to select OSD menu.
* * : to increase or decrease the setting.

- Using * * to confirm the selection.

24 201P GS3 CM25

◀ Go to cover page

6 To leave factory mode

* After alignment of factory mode, turn off monitor (if you do not turn off monitor, the OSD menu is always at the factory mode), then turn on monitor again (at this moment, the OSD menu goes back to user mode).



Fig. 2.2



Fig. 2.3

7. Alignment of Vg2 cut-off point, white tracking (OSD control)

Equipment : 1. Video Test Generator-801GC (Quantum Data)

2. Color-analyzer (Minolta CA-100)

Vg2 [(screen), at the bottom of the L.O.T.].

* Apply a video signal in the 1024 x 768 with 68.7 kHz/85 Hz V LIN mode, select the "full white pattern" (sizes 392 x 294 mm).

* Use color-analyzer (Minolta CA-100) to adjust cutoff and white uniformity.

OSD R/G/B cut-off and R/G/B gain can be accessed, with initial data:

9300°K
R cutoff = 30%, R gain = 70% (I°C)
G cutoff = 30%, G gain = 70% (I°C)
B cutoff = 30%, B gain = 70% (I°C)

6500°K
R cutoff = 30%, R gain = 70% (I°C)
G cutoff = 30%, G gain = 70% (I°C)
B cutoff = 30%, B gain = 70% (I°C)

5500°K
R cutoff = 30%, R gain = 70% (I°C)
G cutoff = 30%, G gain = 70% (I°C)
B cutoff = 30%, B gain = 70% (I°C)

Brightness = 50%, Sub-Contrast = 90%, ABL = 50% (I°C)

Step 1: To select the character "FACTORY MODE" as shown in Fig. 2.1, press * * to access the OSD menu for R/G/B gain & cutoff as shown in Fig. 2.2.

Step 2: Press * * for function selection as shown in Fig. 2.3.

Step 3: Use * * to increase or decrease the value as shown in Fig. 2.3.

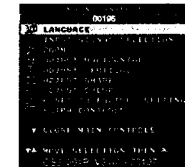


Fig.2.1

BIAS R G B : R(red) G(green) B(blue) cutoff
GAIN R G B : R(red) G(green) B(blue) gain

V FOCUS : Vertical Focus

H FOCUS : Horizontal Focus

V LIN BAL : Vertical Linearity Balance

USER : Horizontal size range

RASTER H: Horizontal raster Shift

RASTER V: Vertical raster Shift

HLIN : Horizontal Linearity

SUB : Vertical Linearity

SUB : Zoom Control range

SUB : Sub Contrast

V OFFSET : Vertical offset

V GAIN : Vertical Gain

ABL : Auto Beam Limit

T CORNER: Corner Correction of TOP

B CORNER: Corner Correction of BOTTOM

CONVERGENCE(V H R): CONVERGENCE Correction of Vertical, Horizontal, Corner (RESERVED).

NS IMPURITY(BR TR BL TL): NS IMPURITY Correction of BOTTOM RIGHT, TOP RIGHT, BOTTOM LEFT, TOP LEFT.

After pressing * * , then Press * * .

7.1 Connect the video input, set brightness control at 50% and contrast at minimum position (OSD), Vg2 at Minimum (counter clockwise, and ABL (OSD) at 50% position. Slowly increase Vg2 voltage until light output is at 0.1 Ft-L +/- 0.01Ft-L (Y=0.1 Ft-L, on the screen of CA-100).

7.2 (The screen of monitor is dark now)

: Press * * to show the OSD menu as shown in Fig. 2.1.

: Select the character "FACTORY MODE" to access the R/G/B adjustment as shown in Fig. 2.2 and Fig. 2.3.

: Adjust the cutoff of R/G/B to get 9300K (x=0.283 +/- 0.015, y=0.298 +/- 0.015), and brightness output at 0.07 +/- 0.01 Ft-L (Y=0.07Ft-L).

7.3 : Press * * to set contrast at maximum (100%).

: Adjust gain of R/G/B to get 9300K (x=0.283 +/- 0.015, y=0.298 +/- 0.015, don't care about the Y value)

7.4 Apply a small white square 10 x 10 cm pattern, brightness set to center (50%), and contrast at maximum (100%), adjust Sub-contrast control (OSD) to reach 32 +/- 2 Ft-L.

7.5 Apply full white pattern at 9300K, adjust ABL (OSD) to reach 32 +/- 2 Ft-L (contrast at maximum 100%, brightness at center 50%).

◀ Back

Forward ▶

◀ Back

Forward ▶

Electrical Adjustments (Continued)

201P GS3 CM25 25

◀ Go to cover page

7.6 : Select the 6500K colour temperature as shown in Fig. 2.2.

: Adjust the R/G/B cutoff and R/G/B gain as shown in procedure 7.2-7.3 to get

R/G/B cutoff $x = 0.313 \pm 0.015$
 $y = 0.329 \pm 0.015$

R/G/B gain $x = 0.313 \pm 0.015$

$y = 0.329 \pm 0.015$

$Y = 28 \pm 2$ Ft-L (Adjust Sub-contrast control (OSD))

7.7 : Select the 5500K colour temperature as shown in Fig. 2.2.

: Adjust the R/G/B cutoff and R/G/B gain as shown in procedure 7.2-7.3 to get

R/G/B cutoff $x = 0.332 \pm 0.015$
 $y = 0.347 \pm 0.015$

R/G/B gain $x = 0.332 \pm 0.015$

$y = 0.347 \pm 0.015$

$Y = 25 \pm 2$ Ft-L (Adjust Sub-contrast control (OSD))

8. Picture geometry setting (factory pre-set modes)

- Apply a video signal with cross-hatch pattern.
- Apply a video signal in the 1024 x 768 with 68.7 kHz/85 Hz mode.
- Set brightness and contrast controls to their center positions (OSD control).

8.1 Horizontal geometry (OSD control)

- Adjust the H-width to 392 mm
- Adjust the H-phase to center position.

8.2 Vertical geometry (OSD control)

- Adjust vertical size to 294 mm
- Adjust V-phase to center position.

8.3 Trapezoid distortion (OSD control)

- Adjust the trapezoid to get optimal vertical lines.

8.4 Pincushion (OSD control)

- Adjust the pincushion to get optimal vertical line.

8.5 Parallelogram (OSD control)

- Adjust parallelogram so that vertical lines are vertical or symmetrically about the center vertical axis.

8.6 Unbalance-pin (OSD control)

- Adjust the unbalance-pin so that that vertical border lines are aligned symmetrically.

8.7 Rotation (OSD control)

- Adjust picture so that vertical tilt is less than ± 0.5 mm.

8.8 Top/Bottom corner (control)

- Adjust the top/bottom corner control to get optimum corner geometry.

8.9 Store the preset results by selecting the "exit" (OSD control).

- Repeat the procedure 8.1 to 8.9 until all the preset timings have been adjusted completely

9. Focus adjustment

: Apply a video signal in the 1024 x 768 with 68.7 kHz/85 Hz mode

: Select * @ * pattern.

: Set the brightness at center (50%) and the contrast to 22 FL.

: Adjust focus potentiometers (top of L.O.T.) Focus 1 for horizontal focus and Focus 2 for vertical focus so that the picture at 2/3 of the diagonal lines (from center to four corners) of the displayed screen is as sharp as possible.

10. Loading DDC code

The DDC HEX data should be written into the DDC IC by EEPROM writer or equivalent method.

a: Service DDC Kit

DDC Module (DDC cable), Part number = 4822 320 12004
 DDCV2A.EXE software (3.5" disk), Part number = 3138 106 10065

b: Please refer to Service information 4822 727 21027(4822 727 21038) for using the Service DDC Kit.

26 201P GS3 CM25

◀ Go to cover page

Mechanical Instructions

0. Location of the panel

0.1 Main panel (1160)

0.2 Video panel (1162)

1. General

To be able to perform measurements and repairs on the "circuit boards", the monitor should be placed in Service Position (fig. 1) first:

How to remove the back cover of monitor :

There are 2 screws in the lid [1 screw are at the right side of the monitor, The other 1 screw are at the left side of the monitor], to fix the front cabinet and back cover of the monitor.

Step 1: To open the lid at the right-upper side and 1 screw in right-downer side of the monitor.(FIG.3)

Step 2: To open the lid at the left-upper side and 1 screw in left-downer side of the monitor.(FIG.4)

Step 3: To remove the back cover, you can see FIG.5

Step 4: To remove the 16 screws on the metal shield, and remove the metal shield, you can see FIG.6.

Chassis :

- After remove the back cover & metal shield, you can see the inside of the monitor as Fig. 6.
- To remove 16 screws for service position as Fig. 5 to Fig. 8.
- Include remove bottom plate screw, then slide out chassis board and disconnect metal shield.

Video panel :

- After remove the metal frame (Fig. 5), to remove the metal shield on rear side of Video panel for measurement.

Main panel :

- After remove the metal frame.
- To cut out cable tie and disconnect "video panel"
- To disconnect EHT cable
- To disconnect ground wire (1703) of video board.
- To disconnect M1311(4pin) to control panel.
- To disconnect M1501(4pin) yoke connector.
- To disconnect M1131(2pin) degaussing coil
- To slide out Main panel as Fig. 1.

Service position :

To get service position as Fig. 1 through Fig. 2 to Fig. 8.

2. Repair Instructions

After the service position was obtained, all the panel's copper track side could be accessed.



Fig. 2



Fig. 3



Fig. 4



Fig. 5



Fig. 6

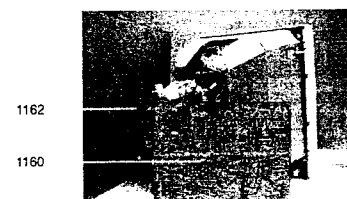


Fig. 7



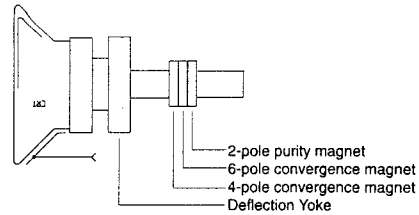
Fig. 8

Fig. 1 Service Position

Go to cover page

1. Purity adjustment

- Make sure the monitor is not exposed to any external magnetic field.
- Produce a full red pattern on the screen, adjust the purity magnet rings on the PCM assy (on CRT) to obtain a complete field of the color red. This is done by moving the two tabs (2-pole) in such a manner that they advance in an opposite direction but at the same time to obtain the same angle between the two tabs, which should be approximately 180 degree.
- Check by full green pattern and full blue pattern again to observe their respective color purity.



2. Static convergence

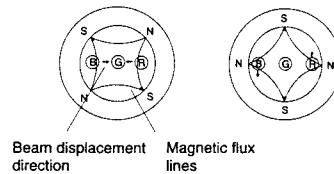
Introduction

Slight deviation in the static convergence can be corrected by using two permanent pairs of magnets which are fitted around the neck of the CRT. These are the 4-pole magnet and the 6-pole magnet. The 4-pole magnet move the outermost electron beams (R and B) parallel in the opposite direction from the other. The 6-pole magnet moves the outermost electron beam (R, B and G) parallel in the opposite direction from the other. The magnetic field of the above magnets do not affect the center of the CRT neck.

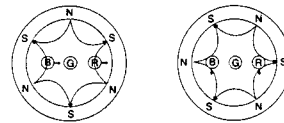
Setting

- Before the static convergence setting can be made, the monitor must be switched on for 30 minutes.
- The focus setting must be made correctly.
- Signal: 640 × 480, 31.5 kHz/60 Hz mode.
- Set the tabs of the 4-pole magnet in the neutral position. This is when the tabs are opposite one another. In this position the magnets do not affect the deflection of the R and B electron beams.
- Set the tabs of the 6-pole magnet in the neutral position. This is when the tabs are opposite one another. In this position the magnets do not affect the deflection of the R, B, and G electron beams.
- First set the 4-pole magnet optimally.
- Then set the 6-pole magnet optimally.
- If the convergence is not now optimal, then adjust to the optimal setting with the 4-pole magnet and then with the 6-Pole magnet again.
- Set the tabs of the 6-pole magnet in the neutral position. This is when the tabs are opposite one another. In this position the magnets do not affect the deflection of the R, B, and G electron beams.
- First set the 4-pole magnet optimally.
- Then set the 6-pole magnet optimally.
- If the convergence is not now optimal, then adjust to the optimal setting with the 4-pole magnet and then with the 6-pole magnet again.

4-pole Beam motion produced by the 4-pole convergence magnet



6-pole Beam motion produced by the 6-pole convergence magnet



Back

Forward

Go to cover page

Safety test requirements

All units that are returned for service or repair must pass the original manufactures safety tests. Safety testing requires both Hipot and Ground Continuity testing.

HI-POT TEST INSTRUCTION

1. Application requirements

- All mains operated products must pass the Hi-Pot test as described in this instruction.
- This test must be performed again after the covers have been refitted following the repair, inspection or modification of the product.

2. Test method

2.1 Connecting conditions

- The test specified must be applied between the parallel-blade plug of the mains cord and all accessible metal parts of the product.
- Before carrying out the test, reliable conductive connections must be ensured and thereafter be maintained throughout the test period.
- The mains switch(es) must be in the "ON" position.

2.2 Test Requirements

All products should be HiPot and Ground Continuity tested as follows:

Condition	HiPot Test for products where the mains input range is Full range (or 220V AC)	HiPot Test for products where the mains input is 110V AC (USA type)	Ground Continuity Test requirement
Test voltage	2820VDC (2000VAC)	1700VDC (1200VAC)	Test current: 25A, AC Test time: 3 seconds (min.) Resistance required: $\leq 0.09 + R$ ohm, R is the resistance of the mains cord.
Test time (min.)	3 seconds	1 second	
Trip current (Tester)	set at 100 uA for Max. limitation; set at 0.1 uA for Min. limitation	5 mA	
Ramp time	set at 2 seconds		

- The test with AC voltage is only for production purpose, Service center shall use DC voltage.
- The minimum test duration for Quality Control Inspector must be 1 minute. No breakdown during the test.
- The test voltage must be maintained within the specified voltage $\pm 5\%$.
- The grounding blade or pin of mains plug must be conducted with accessible metal parts.

Back

Forward

3. Equipments and Connection

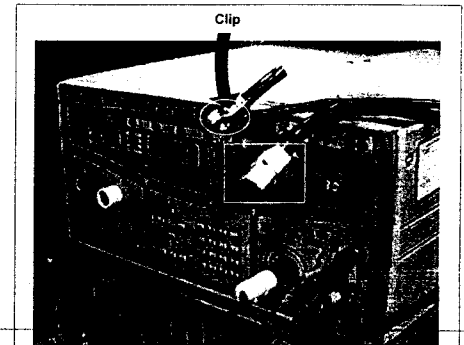
3.1. Equipments

For example :

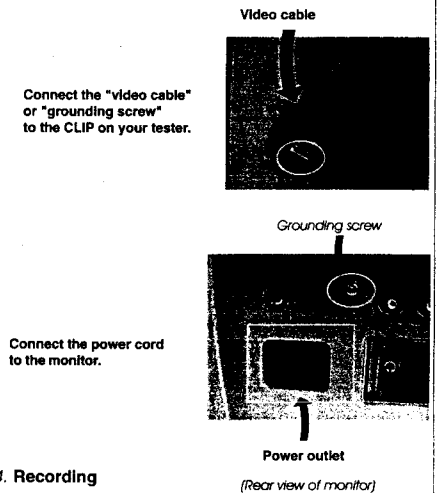
- ChenHwa 9032 PROGRAMMABLE AUTO SAFETY TESTER
- ChenHwa 510B Digital Grounding Continuity Tester
- ChenHwa 901 (AC Hi-pot test), 902 (AC, DC Hi-pot test) Withstanding Tester

3.2. Connection

- Turn on the power switch of monitor before Hipot and Ground Continuity testing.



(ChenHwa 9032 tester)



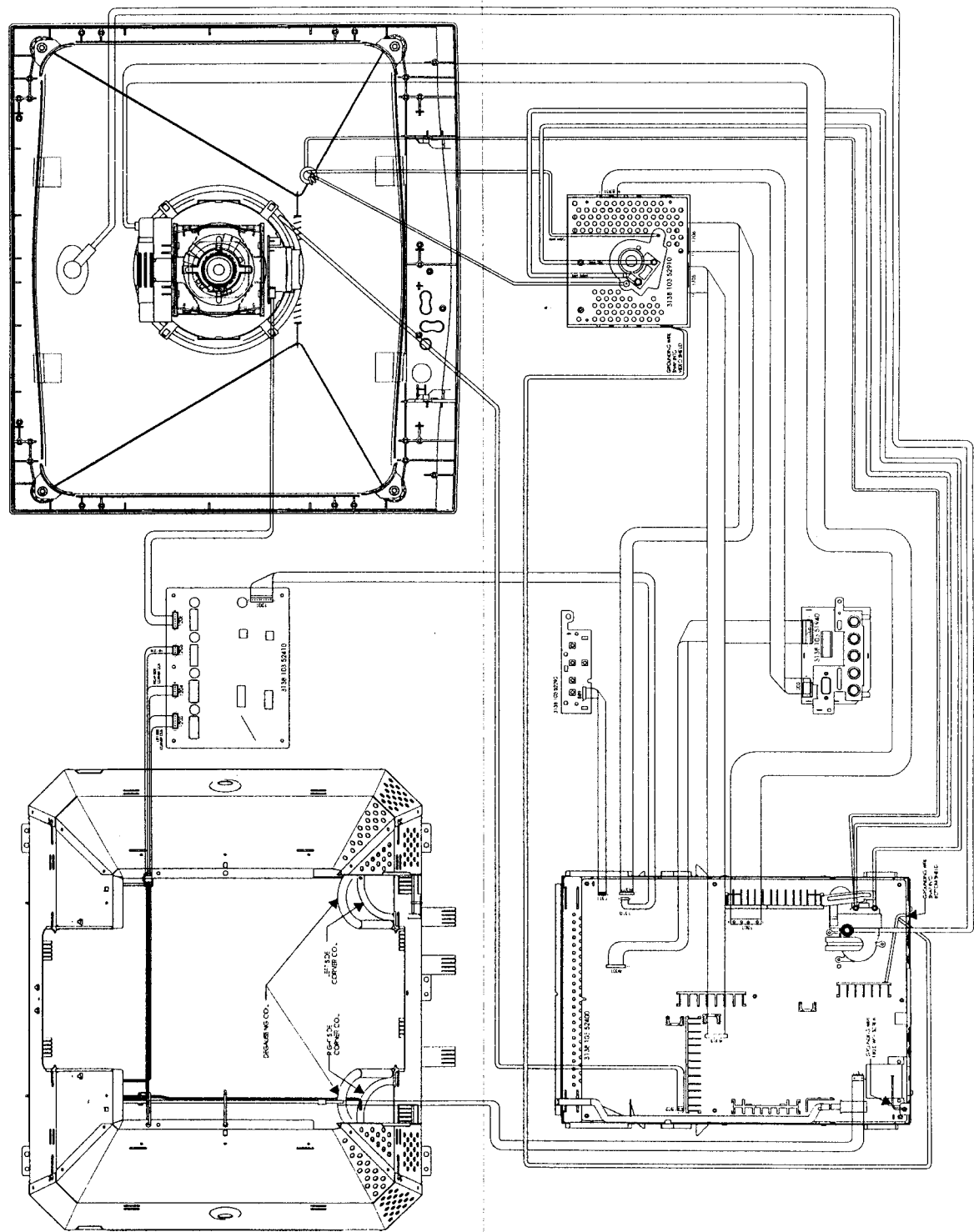
4. Recording

Hipot and Ground Continuity testing records have to be kept for a period of 10 years.

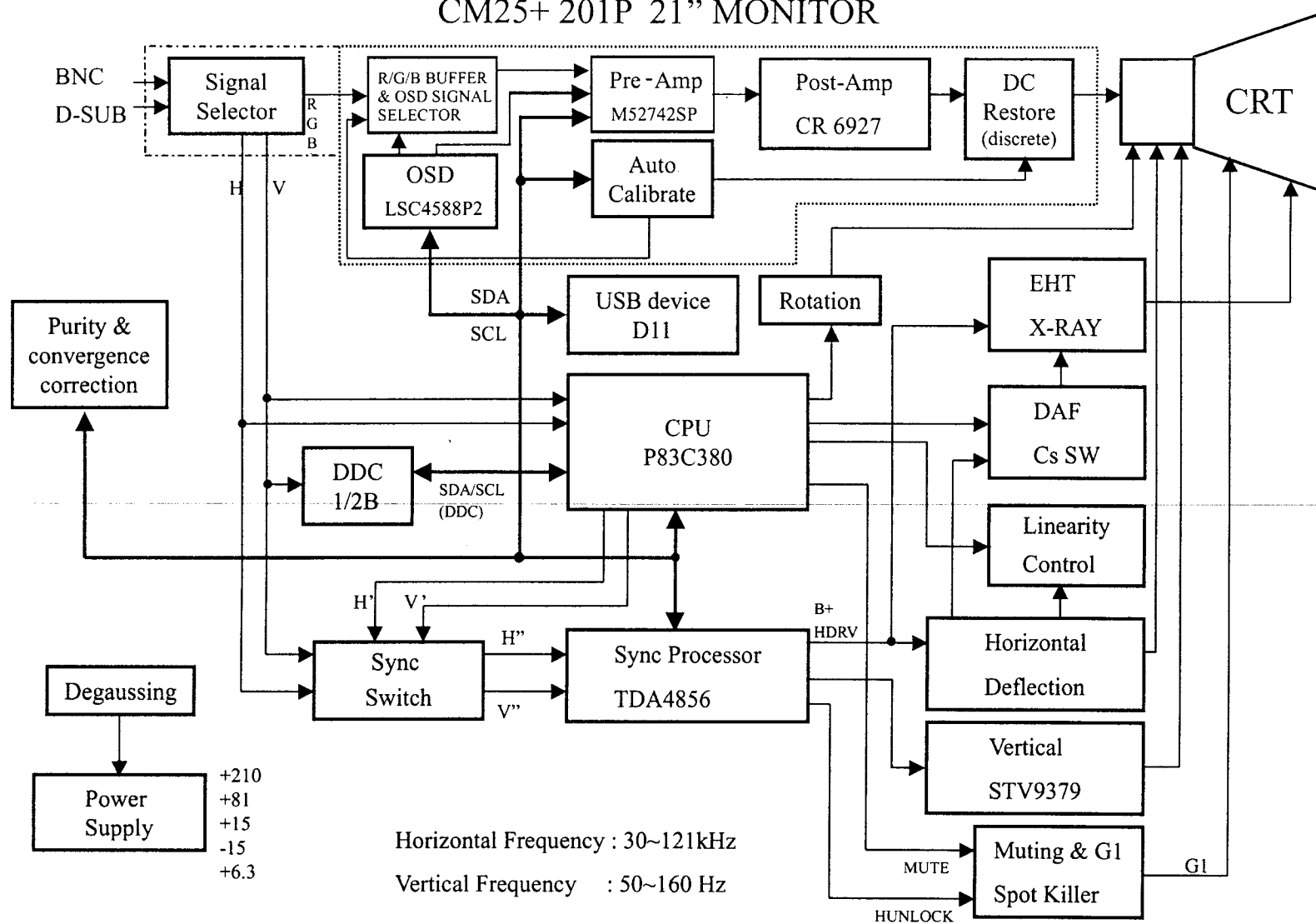
Wiring Diagram

◀◀ Go to cover page

(For reference only)



CM25+ 201P 21" MONITOR



Terminal Schematic Diagram

A1

1 2 3 4 5 6 7 8 9 10 11 12

A

B

C

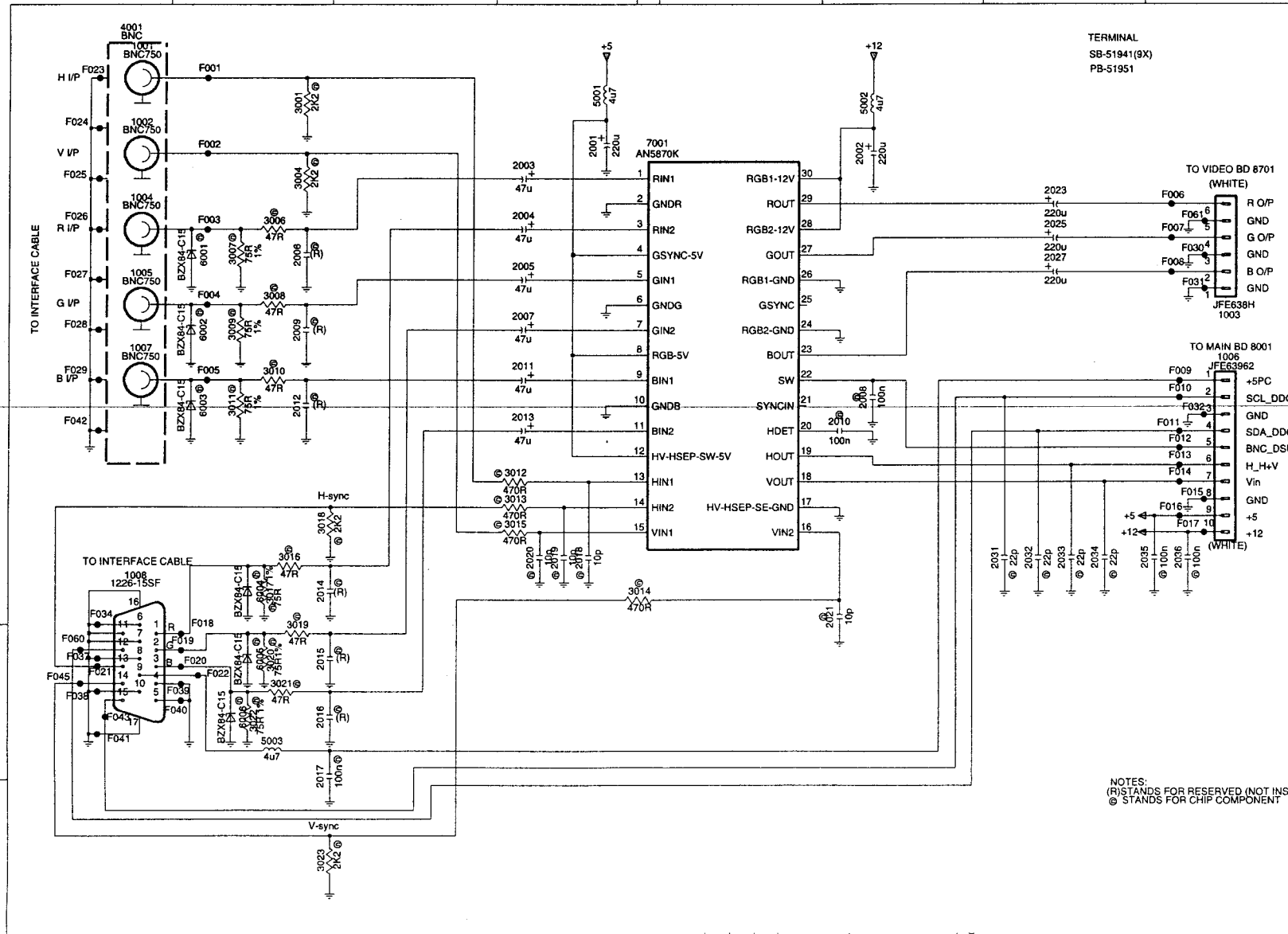
D

E

F

G

H



TERMINAL
SB-51941(9X)
PB-51951

TO VIDEO BD 8701
(WHITE)

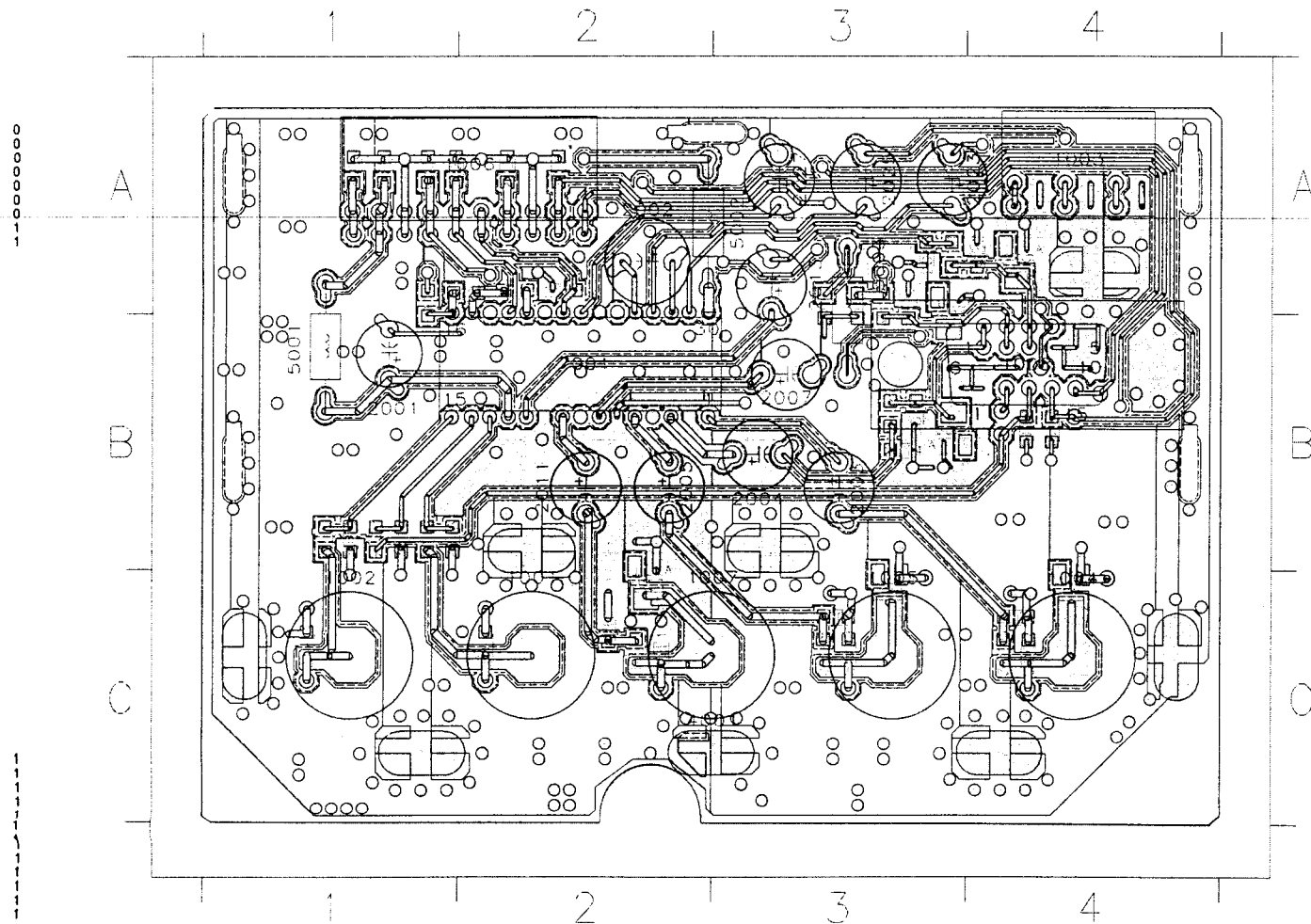
TO MAIN BD 8001
(WHITE)

NOTES:
() STANDS FOR RESERVED (NOT INSERTED)
◎ STANDS FOR CHIP COMPONENT

1001 A2 F039 F3
1002 B2 F040 G3
1003 C11 F041 G2
1004 B2 F042 D2
1005 C2 F043 G2
1006 D11 F045 F2
1007 C2 F060 F2
1008 E2 F061 B11
2001 B6
2002 B8
2003 B5
2004 B5
2005 C5
2006 C4
2007 C5
2008 D8
2009 C4
2010 D8
2011 D5
2012 D4
2013 D5
2014 F4
2015 F4
2016 G4
2017 G4
2018 E5
2019 E6
2020 E6
2021 F8
2023 B10
2025 B10
2027 C10
2031 E10
2032 E10
2033 E10
2034 E10
2035 E11
2036 E11
3001 A4
3004 B4
3006 B3
3007 C3
3008 C3
3009 C3
3010 D3
3011 D3
3012 E5
3013 E5
3014 F7
3015 E5
3016 E4
3017 F3
3018 E4
3019 F4
3020 F3
3021 F3
3022 G3
3023 H4
4001 A2
5001 A6
5002 A8
5003 G3
6001 C3
6002 C3
6003 D3
6004 F3
6005 F3
6006 G3
7001 B7
F001 A3
F002 B3
F003 B3
F004 C3
F005 D3
F006 B11
F007 B11
F008 C11
F009 D11
F010 D11
F011 D11
F012 D11
F013 D11
F014 E11
F015 E11
F016 E11
F017 E11
F018 F3
F019 F3
F020 F3
F021 F2
F022 F3
F023 A2
F024 B2
F025 B2
F026 B2
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F029 D2
F030 C11
F031 C11
F032 D11
F034 F2
F037 F2
F038 F2

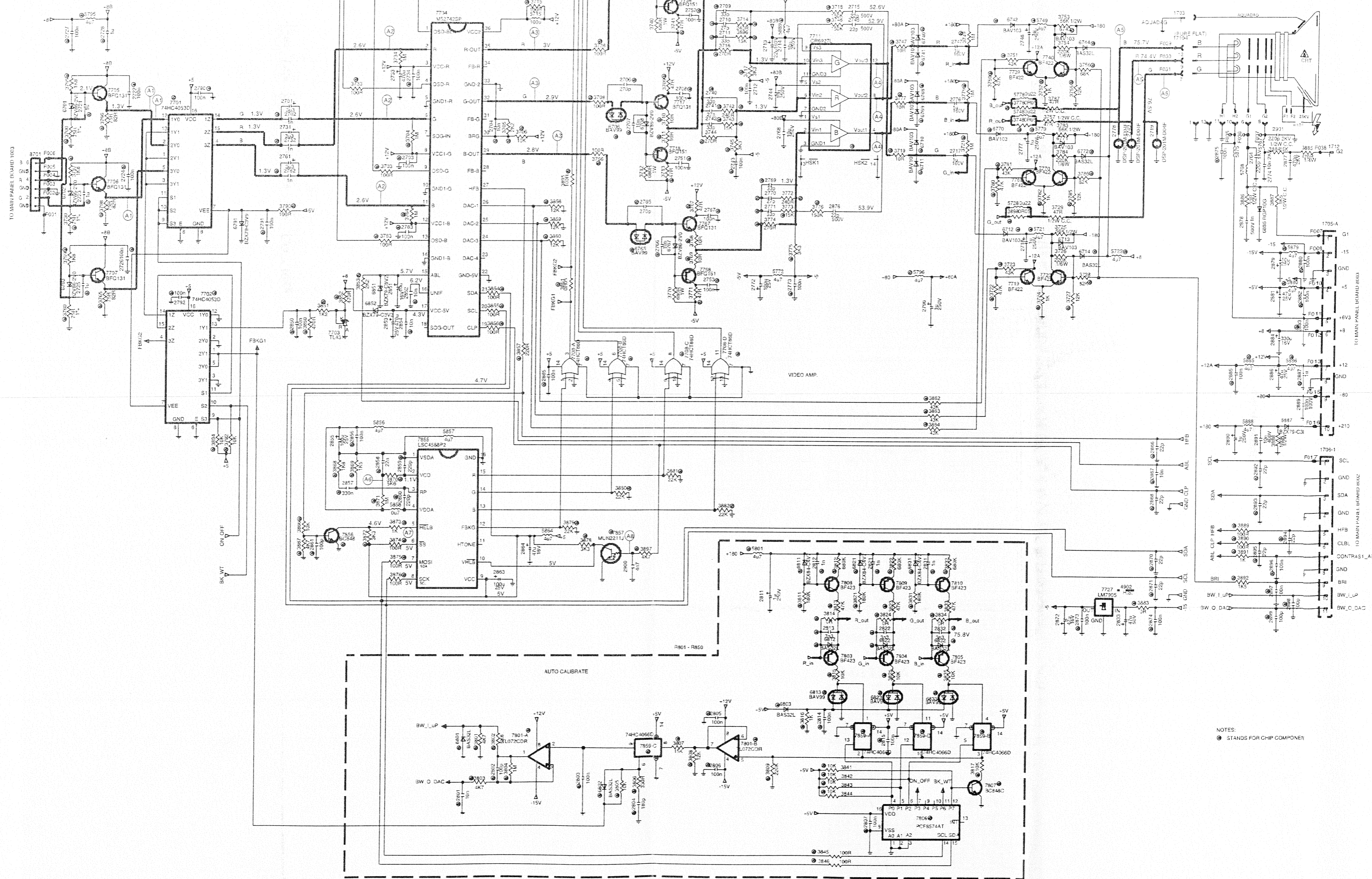
◀◀ Go to cover page

F039 F3
F040 G3
1 F041 G2
F042 D2
F043 G2
1 F045 F2
F060 F2
F061 B11



1001 C2	2036 A1
1002 C1	3001 C2
1003 A4	3004 C1
1004 C4	3006 C4
1005 C3	3007 C4
1006 A2	3008 C3
1007 C2	3009 C3
1008 B4	3010 C2
2001 B1	3011 C2
2002 A2	3012 B1
2003 B3	3013 B1
2004 B3	3014 A1
2005 B2	3015 B1
2007 B3	3016 B3
2011 B2	3017 B3
2013 A3	3018 B4
2023 A4	3019 A3
2025 A3	3020 A3
2027 A3	3021 A3
4001 C3	3022 A4
5001 B1	3023 B4
5002 A3	6001 C4
5003 A3	6002 C3
7001 B2	6003 C2
2006 C4	6004 B3
2008 A2	6005 A3
2009 C3	6006 A4
2010 A2	
2012 C2	
2014 B3	
2015 A3	
2016 A3	
2017 A3	
2018 B1	
2019 B1	
2020 B1	
2021 A2	
2031 A2	
2032 A2	
2033 A1	
2034 A1	
2035 A1	

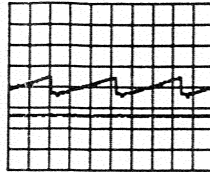
A2



Waveform (A)

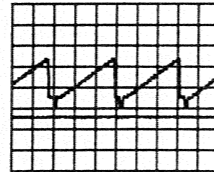
1703 B20 3769 F12 7769 E17
 1705 A E22 3770 G11 7770 E17
 1706-1 D2 3771 G12 7801 A N9
 17104 B20 3772 E13 7801 B N13
 1712 D22 3773 E13 7803 M14
 2701 G2 3774 E13 7804 M15
 2702 D6 3775 F13 7805 M16
 2703 D7 3776 E14 7806 O15
 2704 D6 3777 C15 7807 O17
 2706 C10 3778 C17 7808 K14
 2707 D10 3779 C16 7809 K15
 2708 C11 3780 E17 7810 K16
 2709 B12 3781 D17 7855 I7
 2710 B12 3782 E17 7855 K6
 2711 B12 3783 D18 7857 K10
 2712 C13 3784 D18 7859 A N14
 2713 C13 3785 E18 7859 B N16
 2714 C13 3786 E18 7859 C N11
 2715 B14 3787 C18 7859 D N15
 2717 D16 3790 E5 8701 D1
 2718 F17 3792 I4 8701 E1
 2719 D16 3795 C1 8702 E1
 2721 D1 3796 D2 8703 E1
 2722 C2 3797 E1 8704 E1
 2723 E1 3798 E2 8705 E1
 2724 E2 3799 F1 8706 D1
 2725 G1 3801 N8 8707 F22
 2726 F2 3802 N8 8708 F22
 2727 B1 3803 O8 8710 F22
 2728 B2 3804 N8 8711 G22
 2731 D5 3805 O10 8712 G22
 2732 D5 3806 D11 8713 H22
 2733 G7 3807 N11 8715 H22
 2734 G7 3808 N12 8716 I22
 2735 A10 3809 N13 8717 I22
 2738 A11 3811 L13 8720 B19
 2739 A11 3812 K14 8720 C19
 2740 C12 3813 L14 8721 C19
 2741 D12 3814 L14 8722 D20
 2742 D12 3815 M14 8723 D21
 2743 D12 3816 N13 8724 D21
 2744 C13 3817 N16 8725 D22
 2745 B14 3821 L14
 2747 B16 3822 K15
 2748 B17 3823 L15
 2749 D18 3824 L15
 2751 D11 3825 M16
 2752 B11 3831 L15
 2753 F12 3832 K16
 2761 D5 3833 L16
 2762 E5 3834 L16
 2763 F7 3835 M16
 2764 D21 3841 N14
 2765 E11 3842 O14
 2766 F11 3843 O14
 2767 E12 3844 O14
 2768 D13 3845 F14
 2769 E13 3846 P14
 2770 E13 3850 G5
 2771 F13 3851 G5
 2772 F13 3852 G6
 2773 F13 3853 F8
 2774 E21 3854 G8
 2776 C18 3855 G8
 2777 D17 3856 G8
 2778 D19 3857 H9
 2780 C3 3858 E9
 2781 E4 3859 E9
 2782 G3 3860 F9
 2786 G15 3861 F9
 2801 C8 3862 H16
 2802 N8 3863 I16
 2803 O10 3864 I16
 2804 O11 3866 J5
 2805 N12 3867 K5
 2806 N12 3868 K6
 2807 C15 3869 K6
 2811 L13 3870 J7
 2812 K14 3871 J6
 2813 L14 3872 K6
 2814 N14 3873 J7
 2815 N15 3874 K7
 2821 K15 3875 K7
 2822 L15 3876 K7
 2831 K13 3878 K10
 2832 L16 3879 J10
 2833 L18 3880 J10
 2835 G5 3881 J11
 2851 G7 3882 J12
 2852 G7 3883 L19
 2853 G7 3884 D21
 2854 G7 3885 D22
 2855 I6 3886 E21
 2856 I6 3887 E21
 2857 J6 3888 J21
 2858 I5 3889 J21
 2859 I7 3890 K21
 2860 J7 3891 K21
 2861 K5 3892 K21
 2863 K8 3894 I4
 2864 K9 3895 E9
 2865 H6 3896 B12
 2866 I9 3897 K11
 2867 I19 3898 E17
 2868 J19 4902 K19
 2870 K19 5715 B9
 2871 K19 5721 F17
 2872 L18 5722 F19
 2873 L18 5723 E17
 2874 L19 5748 D17
 2875 D22 5749 B17
 2876 E14 5767 D21
 2877 D21 5768 E21
 2878 E21 5777 F13
 2879 F21 5778 C17
 2880 F22 5779 D17
 2881 G21 5785 B2
 2882 G22 5786 F15
 2883 G22 5801 K13
 2884 G21 5802 K
 2885 H21 5803 J
 2886 H21 5804 K9
 2887 H22 5815 D21
 2888 H22 5816 D21
 2889 I21 5817 F22
 2890 I21 5818 F22
 2891 I21 5819 F22
 2892 I21 5820 F22
 2893 I21 5821 H22
 2894 K21 5886 D1
 2895 K21 5888 B13
 2896 K21 6701 D1
 2897 K21 6702 E1
 2898 L22 6703 F1
 2899 L21 6705 D10
 2900 K11 6706 D11
 2901 D21 6710 D15
 2902 D1 6711 D15
 2903 E6 6712 F17
 2904 D7 6713 F18
 2905 D6 6714 F18
 2906 D9 6737 A10
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 2913 E11 6744 B18
 2914 B12 6765 F11
 2915 B9 6767 F11
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 2917 C12 6769 D15
 2918 B14 6770 D17
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 2921 D16 6772 D18
 2922 D17 6791 E4
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 2924 D17 6802 O10
 2925 E18 6803 M13
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 2929 E15 6821 K14
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 2947 C17 7708 C H12
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A1 7701-2



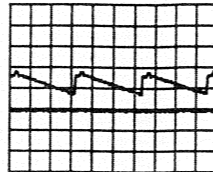
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A3 7704-32



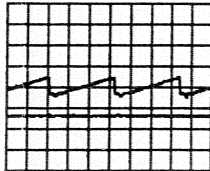
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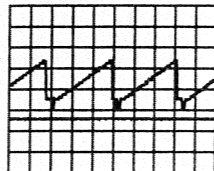
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A1 7701-5



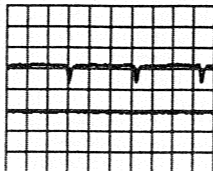
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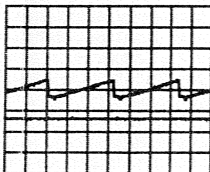
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A6 7855-2



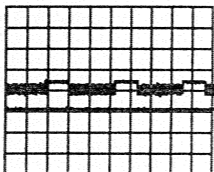
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A1 7701-12



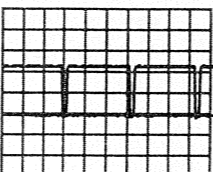
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A4 7711-12



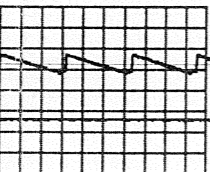
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A7 7855-5



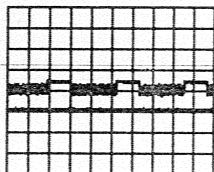
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A2 7704-2



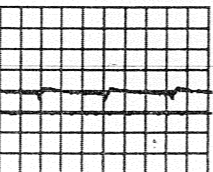
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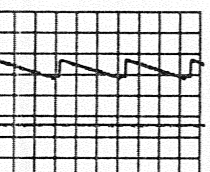
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A8 7857-B



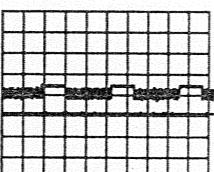
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A2 7704-6



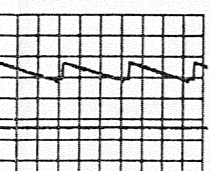
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A4 7711-4



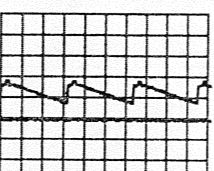
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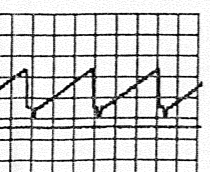
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A5 1710-12



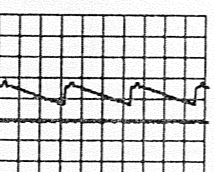
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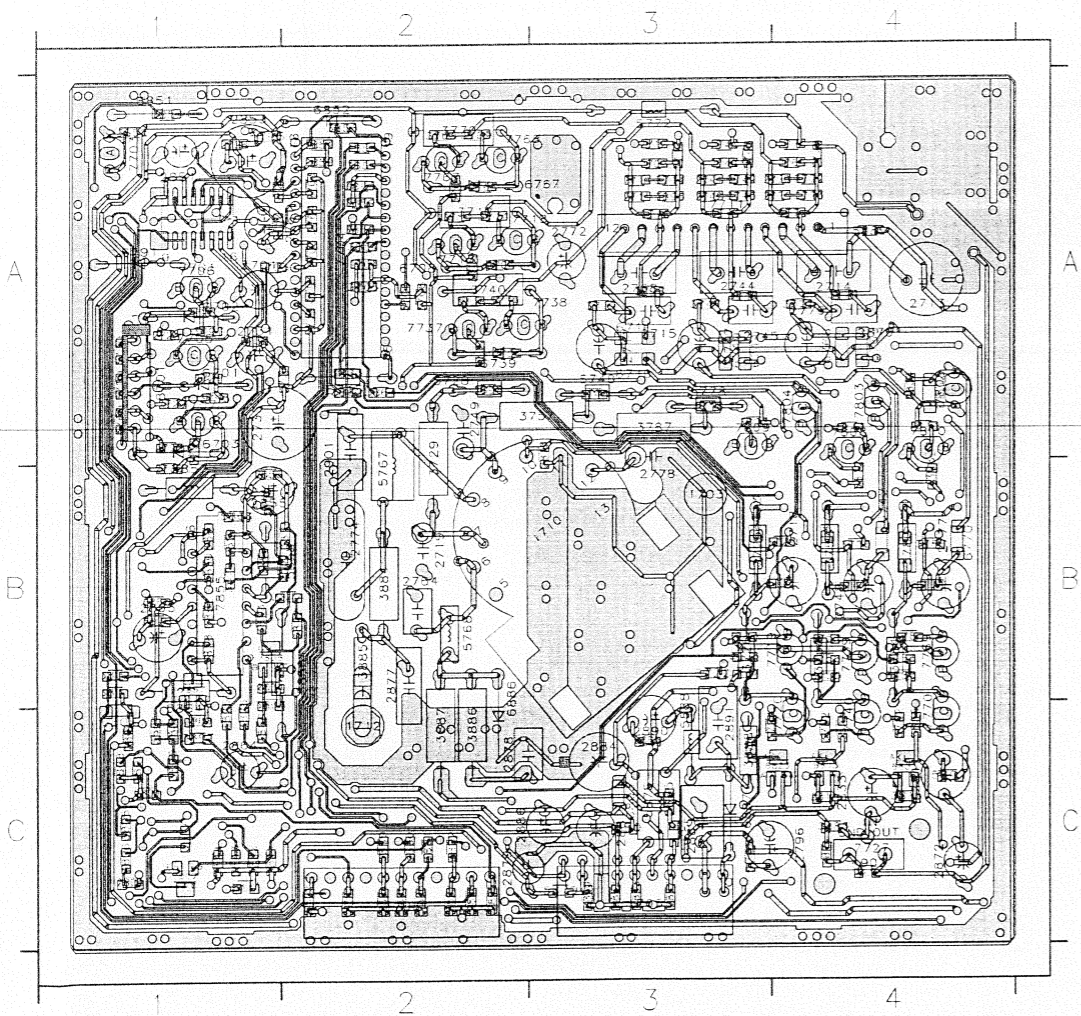
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A5 1710-9



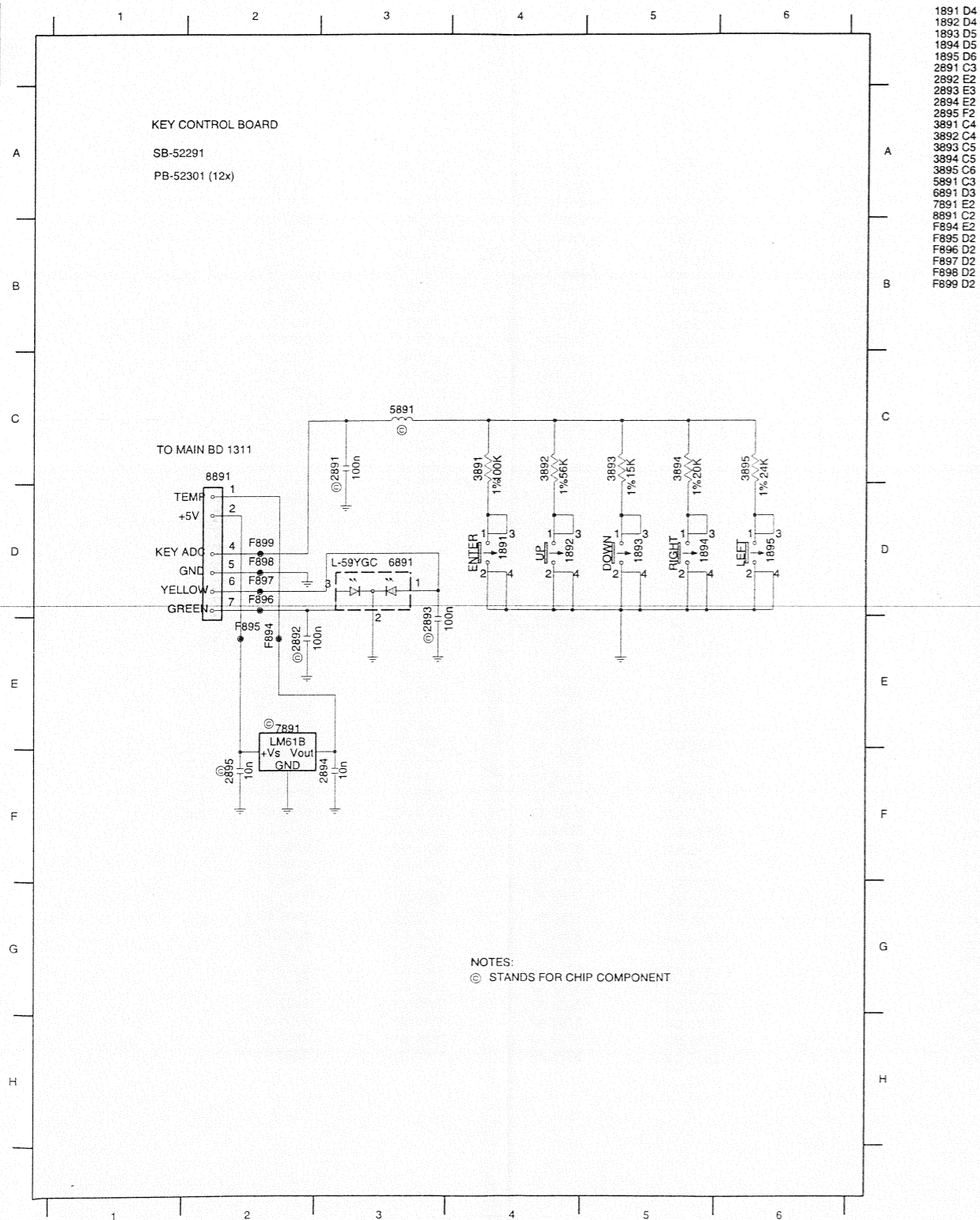
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PCB (A2,Video)

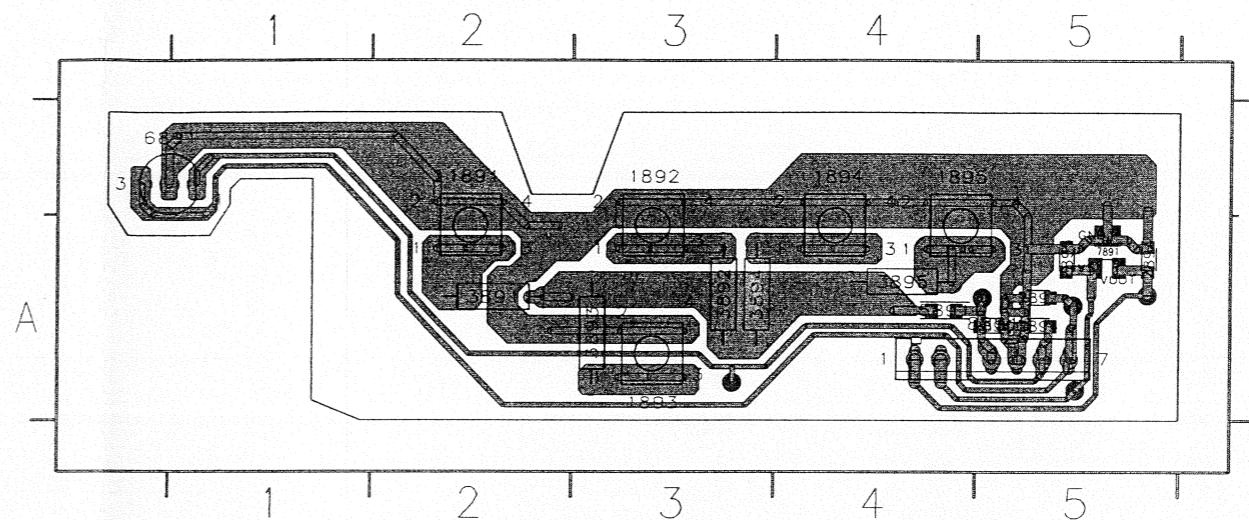


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2715 A3	3885 B2	7809 A3	2722 A1	2900 C1	3785 B4	3879 B1	
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2718 B4	3887 C2	8701 A1	2724 A1	3703 A1	3795 A1	3881 B1	
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E

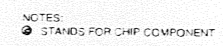


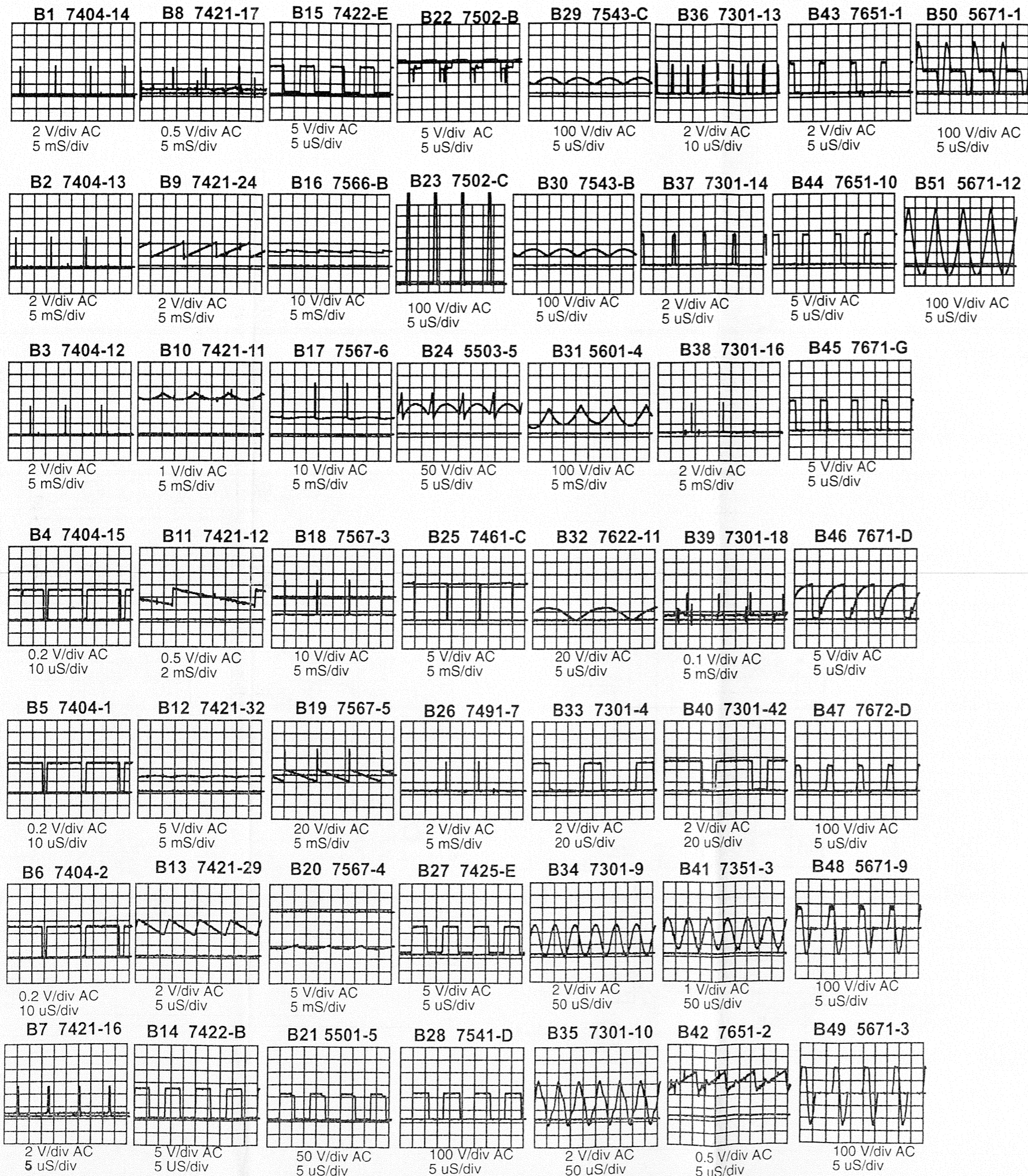
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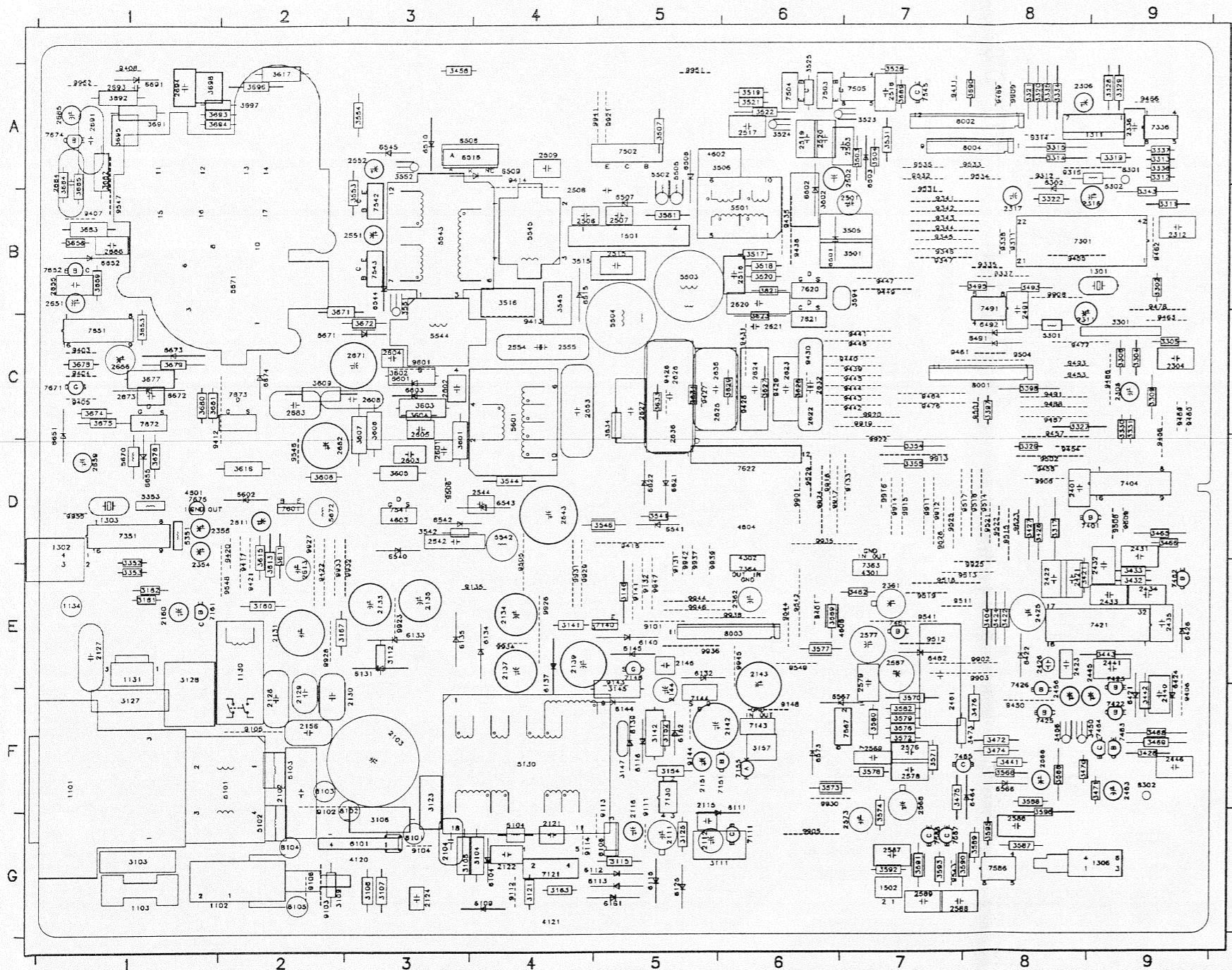
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2895 A5
5891 A4
7891 A5





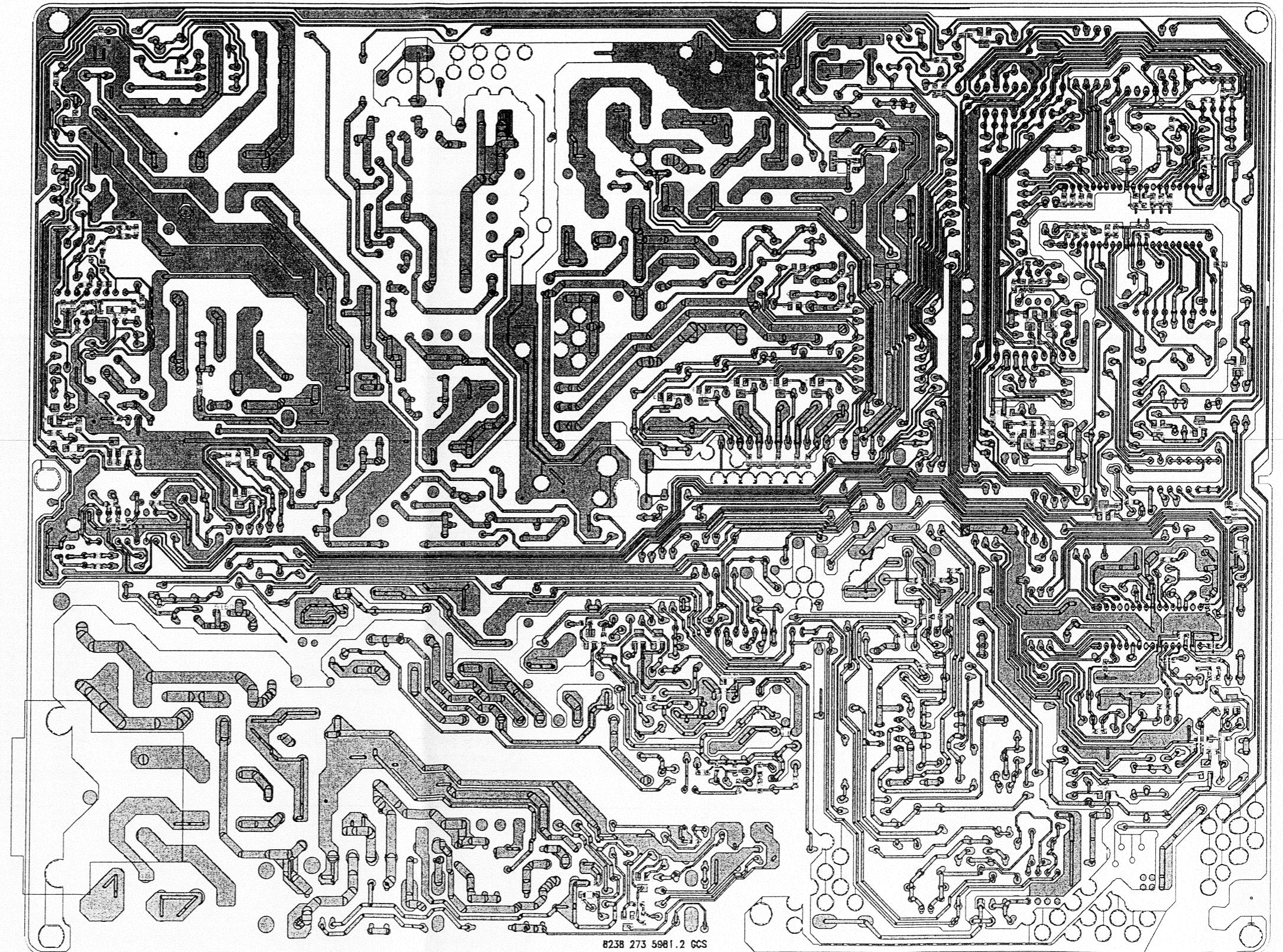
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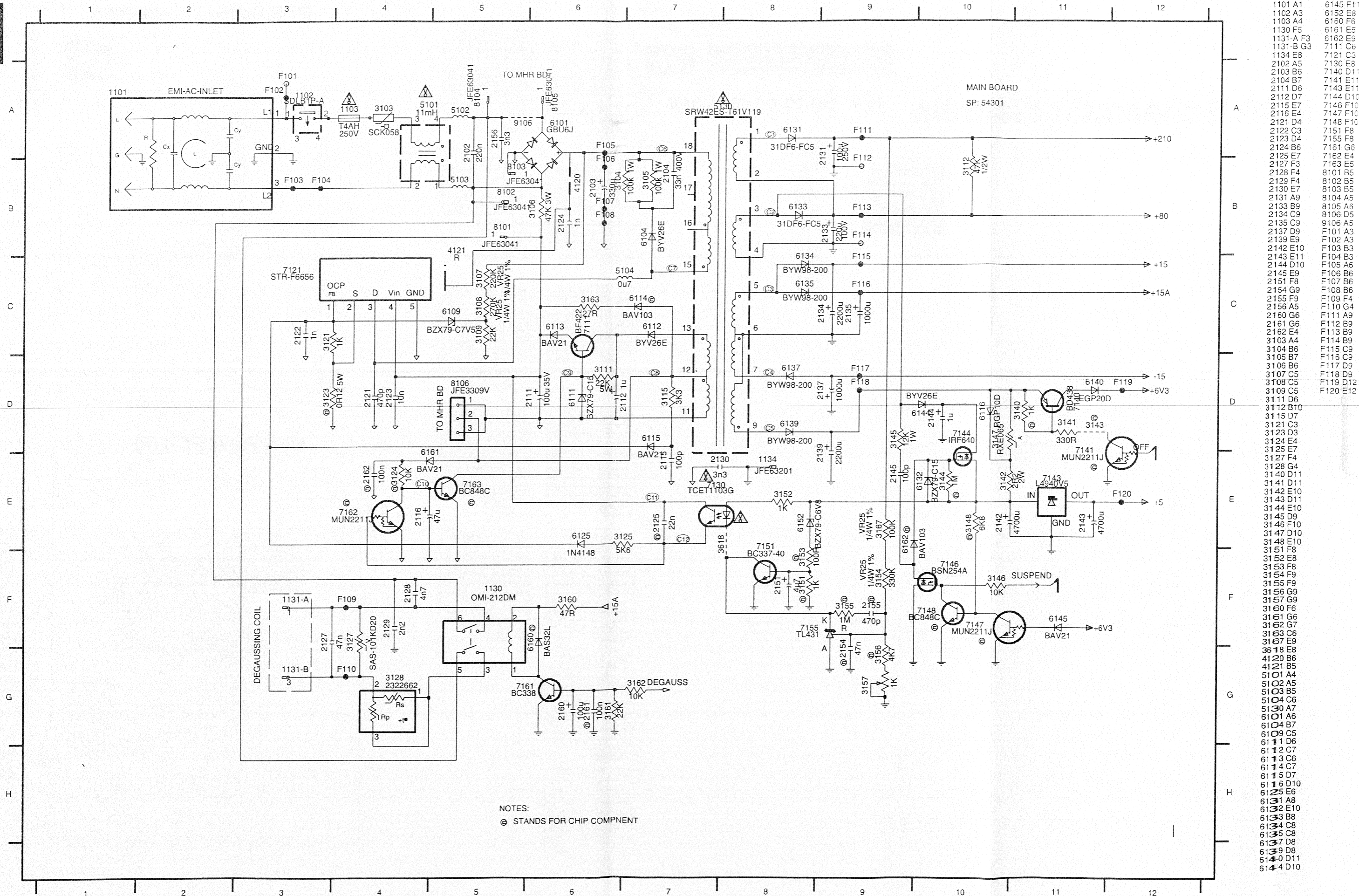


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2501 B7	3152 F5	3524 A6	3698 A1	6651 C1	9143 E5	9516 D8	2352 D1	3628 D6
2502 A7	3154 F5	3525 A6	4120 G3	6652 B1	9144 F5	9517 D8	2353 D1	3630 D6
2503 A7	3157 F6	3528 A7	4121 G4	6655 D1	9148 F6	9518 E7	2391 C7	3632 D6
2506 B4	3160 E2	3531 A7	4301 E7	6671 C2	9311 B8	9519 E7	2392 D8	3652 B1
2507 B5	3161 E1	3541 D5	4302 D6	6672 C1	9312 A8	9521 D8	2424 E7	3653 B1
2508 B4	3162 E1	3542 D3	4601 D1	6673 B8	9313 B8	9522 D8	2442 E9	3655 B1
2509 A4	3163 G4	3544 D4	4602 A5	6674 C2	9315 A8	9523 D8	2443 E9	3656 B1
2515 B5	3167 E2	3545 B4	4603 D3	6691 A1	9333 B8	9525 D7	2445 E9	3657 B1
2516 B6	3301 C9	3546 D5	4604 D6	7111 G6	9336 B8	9526 D7	2462 E7	3660 C1
2517 A6	3302 B9	3551 B3	4606 E7	7121 G4	9337 B8	9529 D6	2464 E7	3661 C1
2518 A7	3304 C9	3552 A3	5101 F2	7130 F5	9341 B7	9531 B7	2492 B8	3662 C1
2519 A6	3305 C9	3553 B3	5102 G2	7140 E5	9342 B7	9532 A7	2493 B8	3663 B1
2520 A6	3306 C9	3554 A3	5103 F2	7143 F6	9343 B7	9533 A8	2545 E7	3664 D1
2543 D3	3309 C9	3566 F8	5104 G4	7144 F5	9344 B7	9534 A8	2546 E7	3665 D1
2544 D3	3311 B9	3569 E6	5130 F4	7146 E5	9345 B7	9535 A7	2612 D2	3666 D1
2551 B3	3312 A9	3570 F7	5301 C8	7151 F6	9346 B7	9541 E7	2652 B1	3667 D1

Deflection/Power Panel P.C.B.(B,C)

[CLICK HERE FOR COMPONENT LAYER](#)

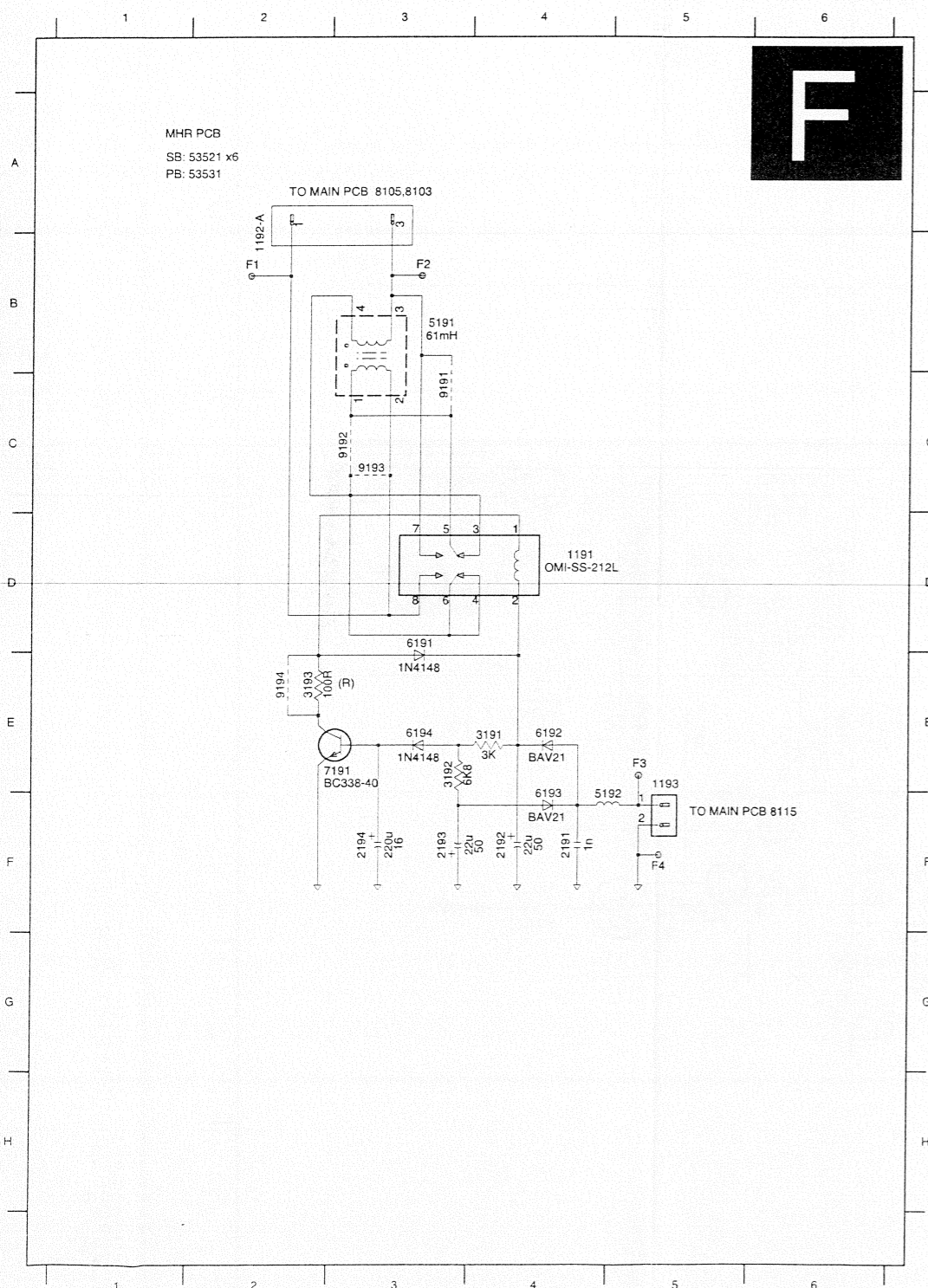




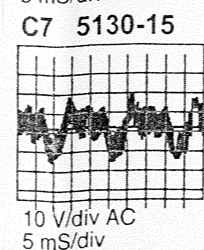
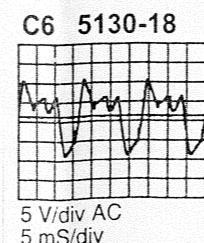
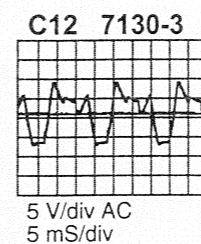
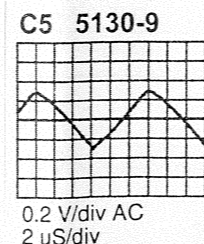
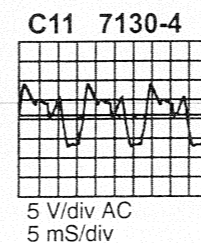
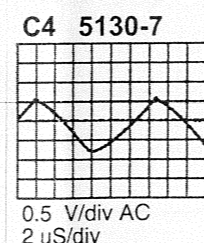
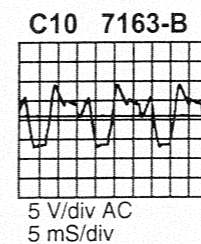
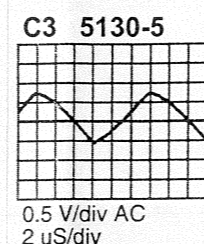
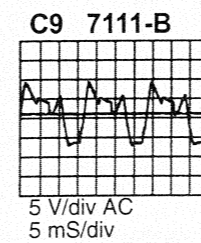
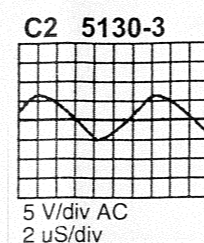
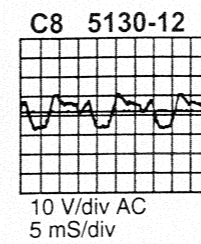
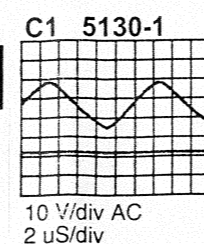
MHR Schematic diagram

201P GS3 CM25 37

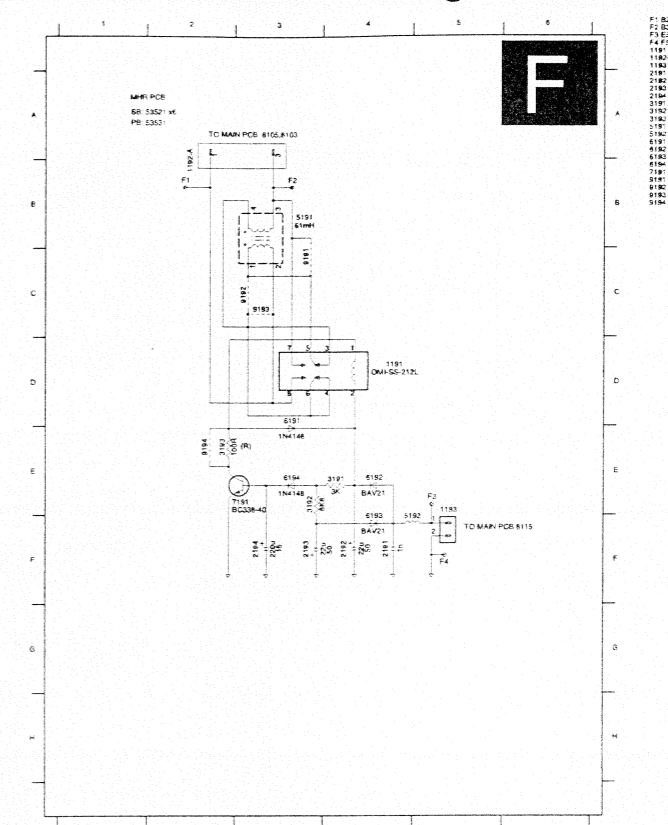
Go to cover page



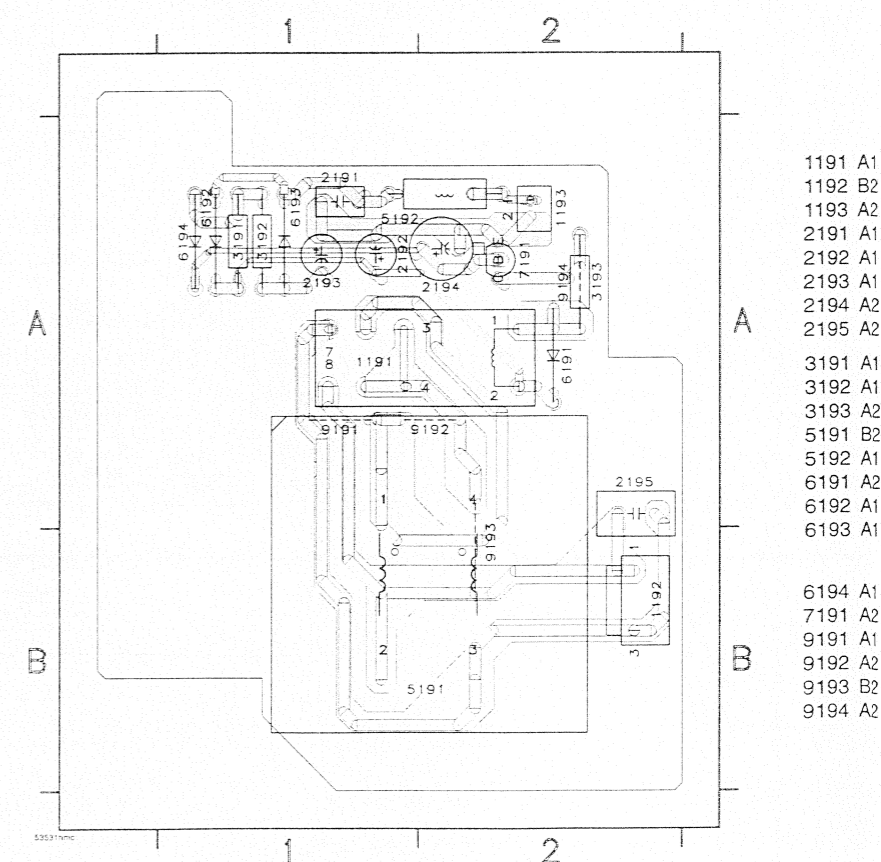
F1 B2
F2 B3
F3 E5
F4 F5
1191 D4
1192-A2
1193 E5
2191 F4
2192 F4
2193 F3
2194 F3
3191 E4
3192 E3
3193 E2
5191 B3
5192 F5
6191 D3
6192 E4
6193 F4
6194 E3
7191 E2
9191 C3
9192 C3
9193 C3
9194 F2



MHR Schematic diagram [◀◀ Go to cover page](#)



MHR Panel PCB (F)

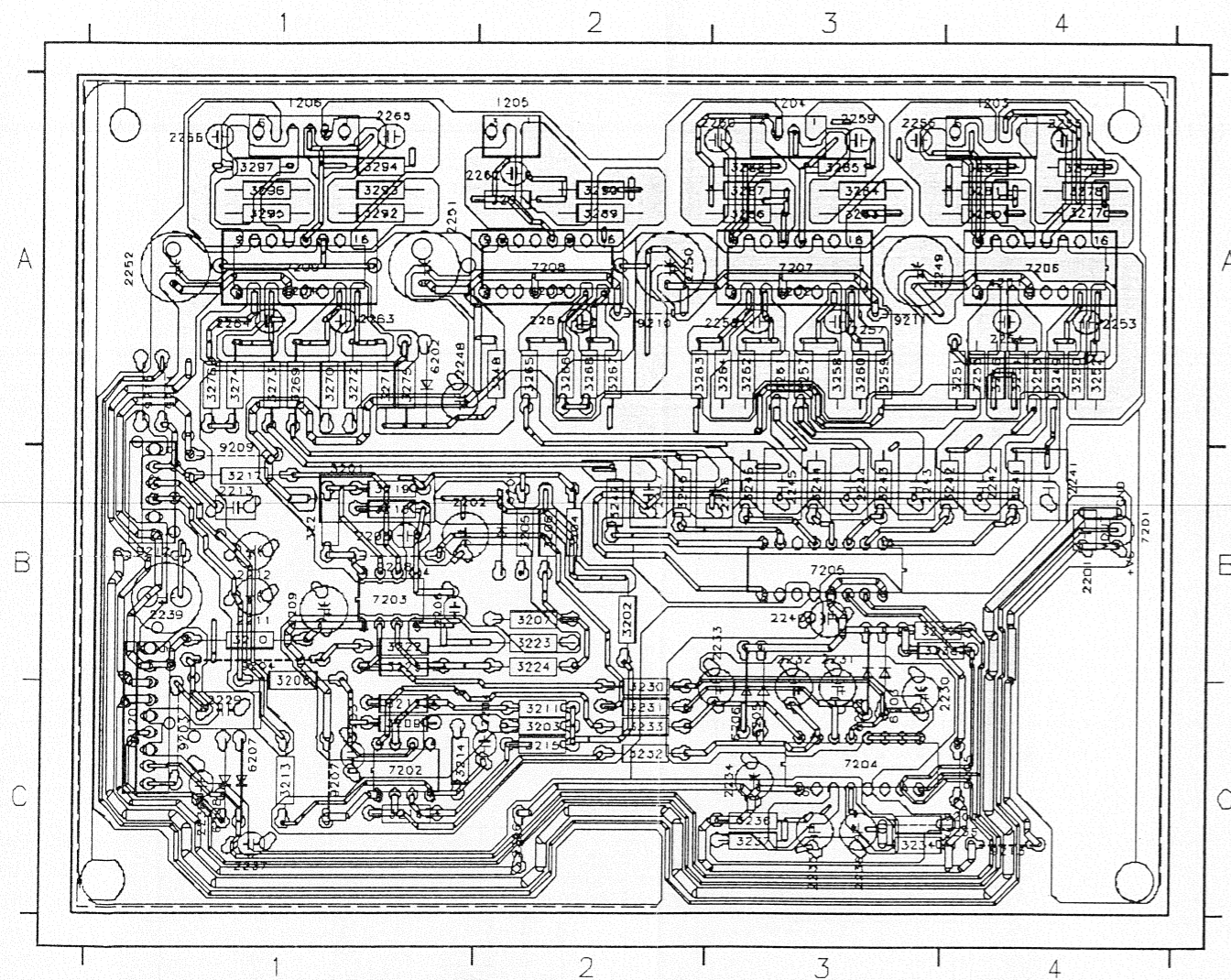


1191 A1
1192 B2
1193 A2
2191 A1
2192 A1
2193 A1
2194 A2
2195 A2

3191 A1
3192 A1
3193 A2
5191 B2
5192 A1
6191 A2
6192 A1
6193 A1

6194 A1
7191 A2
9191 A1
9192 A2
9193 B2
9194 A2

Drive P.C.B. (D)



1201 C1	3207 B2	3276 A1
1202 B1	3208 B1	3277 A4
1203 A4	3209 C1	3278 A4
1204 A3	3210 B1	3279 A4
1205 A2	3211 C2	3280 A4
1206 A1	3212 C1	3281 A4
2201 B4	3213 C1	3282 A4
2202 B1	3214 C1	3283 A3
2203 C1	3215 C2	3284 A3
2204 C2	3216 C1	3285 A3
2205 B1	3217 B1	3286 A3
2206 B1	3218 B1	3287 A3
2209 B1	3219 B1	3288 A3
2211 B1	3221 B1	3289 A2
2212 B1	3222 B1	3290 A2
2213 B1	3223 B2	3291 A2
2229 C1	3224 B2	3292 A1
2230 C4	3225 B1	3293 A1
2231 B3	3230 C2	3294 A1
2232 B3	3231 C2	3295 A1
2233 B3	3232 C2	3296 A1
2234 C3	3233 C2	3297 A1
2235 C3	3234 C3	4201 A4
2236 C3	3235 C4	4202 A3
2237 C1	3236 C3	4203 A2
2238 C1	3237 C3	4204 A1
2239 B1	3238 B3	6201 B2
2240 B3	3239 B3	6202 A1
2241 B4	3241 B4	6203 C3
2242 B4	3242 B4	6204 C3
2243 B3	3243 B3	6205 C3
2244 B3	3244 B3	6206 C3
2245 B3	3245 B3	6207 C1
2246 B3	3246 B2	6208 C1
2247 B2	3247 B2	7201 B4
2248 A1	3248 A2	7202 C1
2249 A3	3249 A4	7203 B1
2250 A2	3250 A4	7204 C3
2251 A1	3251 A4	7205 B3
2252 A1	3252 A4	7206 A4
2253 A4	3253 A4	7207 A3
2254 A4	3254 A4	7208 A2
2255 A4	3255 A4	7209 A1
2256 A3	3256 A4	9201 C4
2257 A3	3257 A3	9203 C1
2258 A3	3258 A3	9204 B1
2259 A3	3259 A3	9205 C4
2260 A3	3260 A3	9206 C2
2261 A2	3261 A3	9207 C1
2262 A2	3262 A3	9208 B1
2263 A1	3263 A2	9209 B1
2264 A1	3264 A3	9210 A2
2265 A1	3265 A2	9211 A3
2266 A1	3266 A2	9212 B1
3201 B1	3267 A2	9213 C4
3202 B2	3268 A2	9214 A1
3203 C2	3269 A1	9215 A1
3204 B2	3270 A1	
3205 B2	3271 A1	
3206 B2	3272 A1	
	3273 A1	
	3274 A1	
	3275 A1	

Repair Tips

201P GS3 CM25 39

◀ Go to cover page

0. Warning

All ICs and many other semi-conductors are susceptible to electrostatic discharges (ESD). Careless handling during repair can reduce life drastically. When repairing, make sure that you are connected with the same potential as the mass of the unit via a wrist wrap with resistance. Keep components and tools also at the same potential!

1. Servicing of SMDs (Surface Mounted Devices)

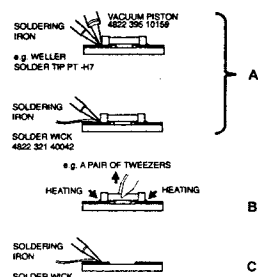
1.1 General cautions on handling and storage

- Oxidation on the terminals of SMDs results in poor soldering. Do not handle SMDs with bare hands.
- Avoid using storage places that are sensitive to oxidation such as places with sulphur or chlorine gas, direct sunlight, high temperatures or a high degree of humidity. The capacitance or resistance value of the SMDs may be affected by this.
- Rough handling of circuit boards containing SMDs may cause damage to the components as well as the circuit boards. Circuit boards containing SMDs should never be bent or flexed. Different circuit board materials expand and contract at different rates when heated or cooled and the components and/or solder connections may be damaged due to the stress. Never rub or scrape chip components as this may cause the value of the component to change. Similarly, do not slide the circuit board across any surface.

1.2 Removal of SMDs

- Heat the solder (for 2-3 seconds) at each terminal of the chip. By means of litz wire and a slight horizontal force, small components can be removed with the soldering iron. They can also be removed with a solder sucker (see Fig. 1A)

Fig. 1 DISMOUNTING



- While holding the SMD with a pair of tweezers, take it off gently using the soldering iron's heat applied to each terminal (see Fig. 1 B).
- Remove the excess solder on the solder lands by means of litz wire or a solder sucker (see Fig. 1C).

1.3 Caution on removal

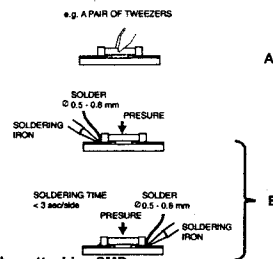
- When handling the soldering iron, use suitable pressure and be careful.
- When removing the chip, do not use undue force with the pair of tweezers.
- The soldering iron to be used (approx. 30 W) should preferably be equipped with a thermal control (soldering temperature: 225 to 250 °C).
- The chip, once removed, must never be reused.

1.4 Attachment of SMDs

- Locate the SMD on the solder lands by means of tweezers and

- solder the component on one side. Ensure that the component is positioned correctly on the solder lands (see Fig. 2A).
- Next complete the soldering of the terminals of the component (see Fig. 2B).

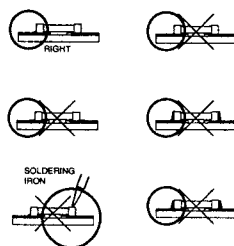
Fig. 2 MOUNTING



2. Caution when attaching SMDs

- When soldering the SMD terminals, do not touch them directly with the soldering iron. The soldering should be done as quickly as possible, care must be taken to avoid damage to the terminals of the SMDs themselves.
- Keep the SMD's body in contact with the printed board when soldering.
- The soldering iron to be used (approx. 30 W) should preferably be equipped with a thermal control (soldering temperature: 225 to 250 °C).
- Soldering should not be done outside the solder land.
- Soldering flux (of rosin) may be used, but should not be acidic.
- After soldering, let the SMD cool down gradually at room temperature.
- The quantity of solder must be proportional to the size of the solder land. If the quantity is too great, the SMD might crack or the solder lands might be torn loose from the printed board (see Fig. 3).

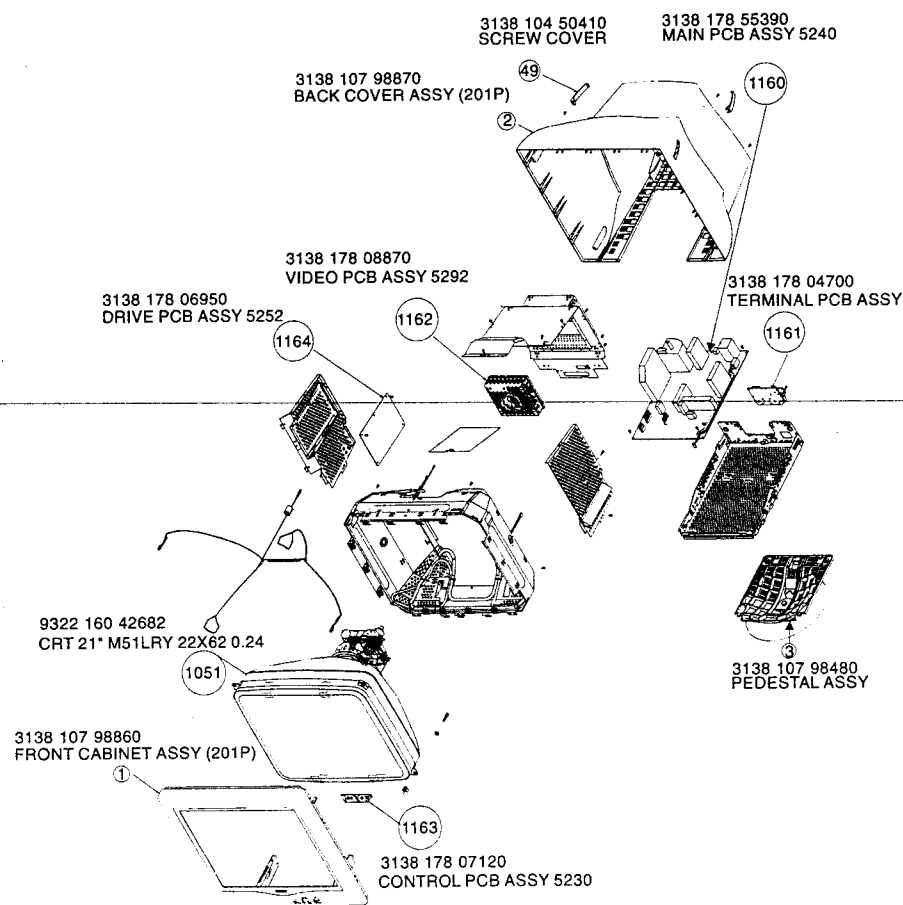
Fig. 3 Examples



40 201P GS3 CM25

◀ Go to cover page

Exploded View



Recommended Parts List

201P GS3 CM 25 41

◀ Go to cover page

Model : 201P10/00

ITEM	CODE	NUMBER	DESCRIPTION
1	3138	107 98860	FRONT CABINET ASSY (201P)
2	3138	107 98870	BACK COVER ASSY (201P)
3	3138	107 98480	PEDESTAL ASSY
4	3138	107 98750	KNOB ASSY
44	3138	104 49470	BASE
46	3138	104 49890	KNOB-OSD
47	3138	104 49880	KNOB-POWER
48	3138	104 50670	LENS-POWER
49	3138	104 50410	SCREW COVER
53	3138	104 49460	SWIVEL
601	3138	117 02140	E-D.F.U. ASSY (P SERIES)
450	3138	106 57450	CARTON
451	3138	106 57100	CUSHION - TOP FRONT
452	3138	106 57110	CUSHION - TOP REAR
453	3138	106 57120	CUSHION - BOTTOM
454	3138	106 45300	P.E. BAG
1053	3138	070 98118	MAINS CORD(220V)-1.5M
1054	3138	168 74450	I/F CABLE
1103	3138	086 00208	FUSE T4AH 250V
1160	3138	178 55390	201P-M(MHR)MAIN PCB ASSY
1161	3138	178 04700	TERMINAL PCB ASSY
1162	3138	178 08870	VIDEO PCB ASSY 5292
1163	3138	178 07120	CONTROL PCB ASSY 5230
1164	3138	178 06950	DRIVE PCB ASSY 5252
1167	3138	178 53330	109P2-MHR PCB ASSY 5353
5671	3138	138 31810	L.O.T. AT2097/26B
7001	9322	142 60682	IC AN5870K 30P
7121	9322	145 76682	IC STRF6656 (LF1352)
7130	9322	140 14667	PHOTOCOUPLER TCET1103G 4P
7143	9322	092 00687	IC L4940V5 3P
7155	9337	711 00686	IC TL431CLPRP 3P
7201	9322	139 99682	IC LM61BIZ 3P
7203	9333	935 10602	IC LM358N 8P (PHILIPS)
7204	9337	681 30112	IC PCF8591P 16P
7205	9352	298 30112	IC TDA8447/N1 16P
7206	9351	920 50112	IC TDA7073A/N3 16P
7301	9352	644 29112	IC P83C380AER/079 42P
1265	3138	178 08880	EEPROM IC ASSY 7336
7351	9352	608 01112	IC PDIUSBD11N 16P
7363	9334	006 10682	IC MC7812CT 3P
7364	9339	208 10682	IC L7808CV 3P
7404	9332	826 60652	IC HEF4053BP 16P
7421	9352	823 32112	IC TDA4856/V2 32P
7491	9322	098 98682	IC ST24LC21BB6 8P
7541	9322	118 29687	FET POW 2SJ448
7567	9319	002 34682	IC STV9379 7P
7651	9322	121 52682	IC L4990A 16P
7672	9319	001 79687	IRF740 POWER MOS-FET
7673	9322	124 60687	FET POW STU8NA80 (ST00) L
7675	9322	106 11676	IC LE33CZ-AP 3P
7701	9337	148 40653	IC 74HC4053D
7704	9322	128 48682	IC M52742SP 36P
7708	9337	140 40653	IC 74HCT86D 14P
7711	9340	551 51127	IC CR6927L 12P
7727	9334	530 30682	IC MC7905CT 3P
7801	9338	369 30668	IC TL072CDR SO-8P
7806	9338	516 60118	IC PCF8574AT SO-16P
7855	8238	274 35560	IC LSC4588P2
7859	9337	144 20653	IC 74HC4066D SO-14P
7891	8238	274 34990	LM61B4M (SOT-23)

Model : 201P10/74

ITEM	CODE	NUMBER	DESCRIPTION
450	3138	106 58200	CARTON
1053	3138	118 75010	MAINS CORD(120V)

Remark: Item 450 and item 1053 are the differences between 201P10/00 and 201P10/74.

◀ Back

Forward ▶

Spare Parts list

[Go to cover page](#)

ITEM	CODENUMBER	DESCRIPTION
1	3138 107 98860	FRONT CABINET ASSY (201P)
2	3138 107 98870	BACK COVER ASSY (201P)
3	3138 107 98480	PEDESTAL ASSY
4	3138 107 98750	KNOB ASSY
24	3138 107 99070	BOTTOM PLATE ASSY (201P)
44	3138 104 49470	BASE
46	3138 104 49890	KNOB-OSD
47	3138 104 49880	KNOB-POWER
48	3138 104 50670	LENS-POWER
49	3138 104 50410	SCREW COVER
53	3138 104 49460	SWIVEL
55	3138 104 49830	POWER LEVEL
56	3138 104 49480	FOOT RUBBER
57	3138 104 40570	HOUSING COVER
58	3138 104 52590	PLASTIC RIVET
178	3138 105 39450	SETTING UP GUIDE
601	3138 117 02140	E-D.F.U. ASSY (P SERIES)
450	3138 106 57450	CARTON
451	3138 106 57100	CUSHION - TOP FRONT
452	3138 106 57110	CUSHION - TOP REAR
453	3138 106 57120	CUSHION - BOTTOM
454	3138 106 45300	P.E. BAG
1051A	9322 160 42682	CRT 21" M51LRY 22X62 0.24
1053A	2438 070 98118	MAINS CORD
1054	3138 168 74450	V/F CABLE
1057	3138 178 75560	1.5M USW CABLE
1058	2422 549 42025	IND FXD BEAD EMI 100MHZ 100E B
1061	3138 168 76050	DEGASSING COIL 62-9908-10
1063	3138 168 76020	CORNER COIL 62-9908-12
1064	3138 168 76030	CORNER COIL 62-9908-13
1061	3138 168 73820	AC INLET ASSY EMI FILTER
1062	2438 128 00107	POWER SWITCH
1103A	2422 086 00028	FUSE T4AH 250V
1130	2438 132 00056	RELAY - OMI-SS-212DM
1131	2438 025 00208	WAFER 2P
1160	3138 178 55390	201P-M(MHR)MAIN PCB ASSY
1161	3138 178 04700	TERMINAL PCB ASSY
1162	3138 178 08870	VIDEO PCB ASSY 5292
1163	3138 178 07120	CONTROL PCB ASSY 5230
1164	3138 178 08950	DRIVE PCB ASSY 5252
1167	3138 178 53330	109P2-MHR PCB ASSY 5353
1191	2438 031 00048	CON BM H 3P M 2.5 625/626 B
1191	2411 121 02038	RELAY OMI-SS-212L
1192	3138 168 76340	3-1p wafer
1193	3138 168 72030	2P WAFER M24262 (VERT)
1201	2438 031 00068	CON BM V 9P M 2.5 625/635 B
1203	3138 168 72960	CON BM H 5P M 2.5 61145
1204	2438 031 00223	CON BM V 4P M 2.5 61144 B
1206	3138 168 73080	CON BM H 6P M 2.5 61146
1265	3138 178 08880	EEPROM IC ASSY 7338
1286	3138 168 73680	BNC CONNECTOR ASSY
1293	2438 031 00167	CON BM ICV 42P F 1.778 DIL B
1301	2438 543 00064	CRYSTAL-12MHZ
1302	2438 031 00227	UP-STREAM PORT CONNECTOR B
1303	2438 543 00064	CRYSTAL-12MHZ
1311	2438 031 00068	CON BM V 7P M 2.5 625/635 B
1501	3138 100 20980	CONNECTOR 4P 2.35 DIA J101
1502	2438 031 00224	CON BM V 2P M 2.5 61142 B
1703	2438 032 01009	CONNECTOR 1P 1.54 DIA
1705	2438 031 00056	CON BM H 10P M 2.5 625/626 B
1706	2438 031 00057	CON BM H 11P M 2.5 625/626 B
1710	2422 500 80055	CRT SCKT CVT3280 11P DIA 22.5
1712	3138 178 77650	1P WAFER 2.0 DIA
1891	2438 128 00196	SWI TACT H EQU. TO 5 GY 160G
1892	2438 128 00196	SWI TACT H EQU. TO 5 GY 160G
1893	2438 128 00196	SWI TACT H EQU. TO 5 GY 160G
1894	2438 128 00196	SWI TACT H EQU. TO 5 GY 160G
1895	2438 128 00196	SWI TACT H EQU. TO 5 GY 160G
2001	2038 035 50227	ELECAP SS 220U 10V 8*7T
2002	2038 035 50312	ELECAP SS 220U 10V 8*7T
2003	2038 035 00037	ELCAP SM 16V 47U PM20 2E T
2004	2038 035 00037	ELCAP SM 16V 47U PM20 2E T
2005	2038 035 00037	ELCAP SM 16V 47U PM20 2E T

[Back](#)

ITEM	CODENUMBER	DESCRIPTION
2007	2038 035 00037	ELCAP SM 16V 47U PM20 2E T
2008	2238 910 15649	CER2 0805 X7R 25V 100N CO
2010	2238 910 15649	CER2 0805 X7R 25V 100N CO
2011	2038 035 00037	ELCAP SM 16V 47U PM20 2E T
2013	2038 035 00037	ELCAP SM 16V 47U PM20 2E T
2017	2238 910 15649	CER2 0805 X7R 25V 100N CO
2018	2238 861 15109	CAP 10PF 0805 SMD
2019	2238 861 15109	CAP 10PF 0805 SMD
2020	2238 861 15109	CAP 10PF 0805 SMD
2021	2238 861 15109	CAP 10PF 0805 SMD
2023	2038 035 50227	ELECAP SS 220U 10V 8*7T
2025	2038 035 50227	ELECAP SS 220U 10V 8*7T
2027	2038 035 50227	ELECAP SS 220U 10V 8*7T
2031	2238 861 15229	CAP 22PF 0805 SMD NPO
2032	2238 861 15229	CAP 22PF 0805 SMD NPO
2033	2238 861 15229	CAP 22PF 0805 SMD NPO
2034	2238 861 15229	CAP 22PF 0805 SMD NPO
2035	2238 910 15649	CER2 0805 X7R 25V 100N CO
2036	2238 910 15649	CER2 0805 X7R 25V 100N CO
2102	2020 307 90011	ACROSS LINE CAP 250V 220N PM10
2103	2038 035 00042	ELCAP LKK 400V S 330U PM 20
2104	8238 274 37251	CAP MEF 400V 33N
2111	2038 031 55101	ELCAP S 35V 100UF PM20 2E
2112	2038 035 50202	ELCAP SH 250V S 1U PM20 A
2115	2020 558 90542	CER2 DC RR 1KV S 100P PM10 A
2116	2038 031 45479	ELCAP VT 25V 47UF PM20 2E T
2121	2020 558 90555	CCAP DC RR 1KV S 470P K A
2122	2020 558 90557	CERC RR 1KVDC 1N PM10
2123	2238 580 16627	CER2 0805 X7R 50V 10N PM10 R
2124	2020 557 90151	CERC DC 500V 1N0 PM10
2125	2238 580 15641	SMD C0805 22N 63V PM10 X710 R
2127	2222 347 41473	POLCAP S 250V 47N PM10 6E
2128	2020 554 90139	CERSAF NSB 250V S 4N7 PM20 B
2129	2020 554 90127	CERSAF NSA 250V S 2N2 PM20 B
2130	2020 554 90149	CERSAF NSA 250V S 3N3 PM20
2131	2038 035 00081	ELCAP SX 250V S 100U PM20 B
2133	2038 035 00099	ELCAP SX 100V S 220U PM20 B
2134	2038 035 00078	ELCAP SX 25V S 2200U PM20 B
2135	2038 035 00078	ELCAP SX 25V S 1000U PM20 B
2137	2038 035 00078	ELCAP SX 25V S 1000U PM20 B
2139	2038 035 00056	ELCAP 2200UF 17R 3N3 K 4B 9
2142	2038 017 00325	ELCAP VZ 10V S 4700U PM20 B
2143	2038 017 00325	ELCAP VZ 10V S 4700U PM20 B
2144	2038 031 95005	ELCAP S 160V 1UF PM20 2E T
2145	2020 558 90542	CER2 DC RR 1KV S 100P PM10 A
2151	2038 031 65478	ELCAP 4UF 50V PM20 VT A
2154	2238 910 15645	CAP 47NF SMD 0805 X7R
2155	2238 861 15471	CMC 0805 NPO 470P 50V J
2156	2020 554 90149	CERSAF NSA 250V S 3N3 PM20
2160	2038 034 52101	ELCAP S 10V 100UF PM20 2E T
2161	2238 910 15649	CER2 0805 X7R 25V 100N CO
2162	2238 910 15649	CER2 0805 X7R 25V 100N CO
2192	2038 302 00203	MEF CAP 630V 47N 6E PM10
2192	2038 034 56229	ELCAP S 50V 22UF PM20 2E T
2193	2038 034 56229	ELCAP S 50V 22UF PM20 2E T
2194	2038 034 53221	ELCAP S 16V 220UF PM20 2E
2251	2252 325 12103	CERC CAP 50V 10N X7R 2E
2252	2038 034 54101	ELCAP S 25V 100UF PM20 2E
2259	2038 034 54101	ELCAP S 25V 100UF PM20 2E
2213	2252 325 12103	CERC CAP 50V 10N X7R 2E
2229	2252 325 12103	CERC CAP 50V 10N X7R 2E
2230	2038 034 53229	ELCAP S 16V 22UF PM20 2E
2231	2038 034 53229	ELCAP S 16V 22UF PM20 2E
2234	2038 034 53229	ELCAP S 16V 22UF PM20 2E
2239	2038 031 42471	ELCAP 470UF 25V PM20 2E 105C B
2240	2038 034 53229	ELCAP S 16V 22UF PM20 2E
2248	2038 034 53229	ELCAP S 16V 22UF PM20 2E
2249	2038 034 24471	ELCAP S 25V 470UF PM20 2E
2250	2038 034 24471	ELCAP S 25V 470UF PM20 2E
2251	2038 034 24471	ELCAP S 25V 470UF PM20 2E
2252	2038 034 23471	ELCAP S 18V 470UF PM20 2E B
2302	2238 580 16614	CER2 0805 X7R 50V 10N PM10
2304	2038 302 50095	MEF CAP 100V 100N PM10 2E
2306	2038 034 56100	ELCAP S 50V 10UF PM20 2E
2309	2238 861 15339	CAP 33PF 0805 SMD NPO
2310	2238 861 15339	CAP 33PF 0805 SMD NPO

[Forward](#)

Spare Parts list

[Go to cover page](#)

ITEM	CODENUMBER	DESCRIPTION
2518	2038 302 50095	MEF CAP 100V 100N PM10 2E
2519	2038 302 50095	MEF CAP 100V 100N PM10 2E
2520	2038 302 50095	MEF CAP 100V 100N PM10 2E
2542	2038 302 00155	MEF CAP 250V 100N PM10
2543	2038 035 00048	ELCAP SEK 250V S 100U PM20 B
2544	2020 558 90561	CERC CAP RR 2KV 220P PM10 B
2545	2238 910 15649	CER2 0805 X7R 25V 100N CO
2546	2238 910 15649	CER2 0805 X7R 25V 100N CO
2551	2038 031 45479	ELCAP VT 25V 47UF PM20 2E T
2552	2038 031 45479	ELCAP VT 25V 47UF PM20 2E T
2553	2038 301 00164	CAP PP PPN 250V S 150N PM5 B
2555	2038 301 00185	CAP PPN 120N 250V PM5 9E
2566	2038 031 65109	ELCAP VT 50V 10UF PM20 2E
2567	2038 031 42471	ELCAP 470UF 25V PM20 2E 105C B
2568	2038 034 55101	ELCAP S 35V 100UF PM20 2E
2569	2020 552 90607	CERC DC NPO 50V 220P PM5 2E T
2576	2038 032 50093	MEF CAP 100V 22N PM10 2E
2577	2038 031 42471	ELCAP 470UF 25V PM20 2E 105C B
2578	2038 032 50095	MEF CAP 100V 100N PM10 2E
2579	2038 302 50099	POLCAP 100V 470N PM10 2E
2586	2038 032 50212	POLCAP 100V 100N PM5 2E T
2587	2038 032 50095	MEF CAP 100V 100N PM10 2E
2588	2038 032 50095	MEF CAP 100V 100N PM10 2E
2589	2038 032 50095	MEF CAP 100V 100N PM10 2E
2601	2020 558 90561	CERC CAP RR 2KV 220P PM10 B
2602	2252 712 14116	CERC CAP 150P 2KV YSR TYPE K 2E T
2603	2020 558 90557	CERC RR 1KVDC 1N PM10
2608	2355 559 00099	CERC CAP 2KV 10N PM20 4E
2611	2038 034 54478	ELCAP S 25V 47UF PM20 2E T
2612	2238 910 15649	CER2 0805 X7R 25V 100N CO
2613	2038 034 56479	ELCAP S 50V 47UF PM20 2E T
2621	2038 301 00188	CAP PP PPN 250V S 68N PM5 6E B
2623	2038 301 00225	MP5 CAP 250N/250V PM5 7E
2624	2038 301 00304	MP5 CAP 560N/250V PM5 7E
2627	2038 301 00225	MP5 CAP 270N/250V PM5
2632	2038 301 00205	CAP PP DTW 250V 82N PM5
2635	2038 301 00311	MP5 CAP 1U 250V PM5 9E
2636	2038 301 00158	CAP MPP MP5 250V S 1U8 PM5 B
2651	2038 034 56108	ELCAP S 50V 1UF PM20 2E T
2652	2238 580 16616	CER2 0805 X7R 63V 1N5 PM10 R
2655	2238 580 16621	MLCC 0805 X7R 3N3 K 4B 9
2655	2038 301 50151	CAP PP PPN 100V S 10N PM2 B
2656	2038 031 45229	ELCAP S 25V 220UF PM20 2E T
2657	2238 580 16615	CER2 0805 X7R 63V 1N2 PM10 R
2658	2238 780 19858	CER2 0805 Y5V 16V 470N P8020 R
2659	2038 034 54479	ELCAP S 25V 47UF PM20 2E T
2660	2238 780 19858	CER2 0805 Y5V 16V 470N P8020 R
2661	2238 780 19858	CER2 0805 Y5V 16V 470N P8020 R
2671	2038 031 92003	ELCAP S 250V 33UF PM20 2E
2672	2238 910 15649	CER2 0805 X7R 25V 100N CO
2673	2020 558 90562	CERC RB 2KVDC 330PF
2681	2238 580 16618	CAP 2NF2 0805 SMD X7R T
2682	2038 035 00081	ELCAP SX 250V S 100U PM20 B
2683	2038 301 00174	CAP PP PPN 630V S 4N7 PM5 A
2684	2222 347 41473	POLCAP S 250V 47N PM10 6E
2685	2038 034 53479	ELCAP S 16V 47UF M 2E T
2686	2020 558 90557	CERC RR 1KVDC 1N PM10
2691	2222 347 41473	POLCAP S 250V 47N PM10 6E
2693	2038 032 00226	CAP MPOL 100V S 1U8 PM5 B
2694	2038 302 50212	POLCAP 100V 100N PM5 2E T
2701	2038 031 65338	CAP VT3.3U50V2 5*11 2E(T)
2702	2238 580 16614	CER2 0805 X7R 50V 10N PM10
2703	2238 910 15649	CER2 0805 X7R 25V 100N CO
2704	2238 580 16627	CER2 0805 X7R 50V 10N PM10 R
2706	2222 861 12271	CER1 0805 NPO 50V 270P PM5
2707	2238 580 16627	CER2 0805 X7R 50V 10N PM10 R
2708	2238 910 15649	CER2 0805 X7R 25V 100N CO
2709	2238 861 15339	CAP 33PF 0805 SMD NPO
2710	2238 861 15379	CAP 27PF 0805 SMD NPO
2711	2238 861 15339	CAP 33PF 0805 SMD NPO
2712	2238 910 15649	CER2 0805 X7R 25V 100N CO
2713	2038 031 92015	ELCAP VT 160V S 22U PM20 B
2714	2252 326 13103	CER CAP X7R 100V 10N K 2E T
2715	2222 691 10229	MINIATURE PLATE CAP 22P 50

Go to cover page

Spare Parts list

ITEM	CODENUMBER	DESCRIPTION
2855	2038 031 35101	ELCAP VT 16V 100UF PM20 2E T
2856	2238 910 15649	CER2 0805 X7R 25V 100N CO
2857	2222 910 18856	CER2 0805 Y5V 25V 330N P8020 R
2858	2238 580 15641	SMD C0805 22N 63V PM10 X710 R
2859	2238 861 15221	MLCC 0860 NPO 220PF J4B 9
2860	2238 861 15221	MLCC 0850 NPO 220PF J4B 9
2861	2238 861 15101	CER2 0805 NPO 50V 100P
2863	2038 031 45101	ECAP S 25V 100UF M 2E T
2864	2038 031 45479	ELCAP VT 25V 47UF PM20 2E T
2865	2238 910 15649	CER2 0805 X7R 25V 100N CO
2866	2238 861 15229	CAP 22PF 0805 SMD NPO
2867	2238 580 16627	CER2 0805 X7R 50V 10N PM10 R
2868	2238 861 15229	CAP 22PF 0805 SMD NPO
2871	2238 861 15229	CAP 22PF 0805 SMD NPO
2872	2038 031 45479	ELCAP VT 25V 47UF PM20 2E T
2873	2238 910 15649	CER2 0805 X7R 25V 100N CO
2874	2238 910 15649	CER2 0805 X7R 25V 100N CO
2875	2238 910 15649	CER2 0805 X7R 25V 100N CO
2876	2222 691 10229	MINIATURE PLATE CAP 22P 500V NPO 2E T
2877	2252 602 14416	CERC CAP DC 2KV 470P PM10 X7R
2878	2020 557 90151	CERC DC 500V 1N0 PM10
2879	2038 031 45109	ELCAP VT 10U 25V 2E M T
2880	2238 910 15649	CER2 0805 X7R 25V 100N CO
2881	2038 031 45479	ELCAP VT 25V 47UF PM20 2E T
2882	2238 910 15649	CER2 0805 X7R 25V 100N CO
2883	2238 910 15649	CER2 0805 X7R 25V 100N CO
2884	2038 031 35331	ELCAP S 16V 330UF PM20 2E T
2885	2238 910 15649	CER2 0805 X7R 25V 100N CO
2886	2038 031 45479	ELCAP VT 25V 47UF PM20 2E T
2887	2222 780 19763	CMC 0805 Y5V 1U M 16V
2889	2038 302 50095	MEF CAP 100V 100N PM10 2E
2890	2038 035 50202	ELCAP SH 250V S 1U PM20 A
2891	2238 910 15649	CER2 0805 X7R 25V 100N CO
2892	2238 910 15649	CER2 0805 X7R 25V 100N CO
2893	2238 861 15229	CAP 22PF 0805 SMD NPO
2894	2238 580 16627	CER2 0805 X7R 50V 10N PM10 R
2894	2238 861 15229	CAP 22PF 0805 SMD NPO
2895	2238 580 16627	CER2 0805 X7R 50V 10N PM10 R
2895	2238 861 15229	CAP 22PF 0805 SMD NPO
2896	2238 910 15649	CER2 0805 X7R 25V 100N CO
2897	2238 910 15649	CER2 0805 X7R 25V 100N CO
2898	2238 861 15101	CER2 0805 NPO 50V 100P
2899	2238 861 15101	CER2 0805 NPO 50V 100P
2900	2238 580 16623	MLCC 0805 X7R 4N7F K 4B 9
2901	2252 602 14216	CERCAP DC 2KV 220P K X7R T
3001	2322 730 61222	RST SM 0805 RC11 2K2 PM5 R
3004	2322 730 61222	RST SM 0805 RC11 2K2 PM5 R
3006	2322 730 61479	RES 47R 0805 SMD RC-11 T
3007	2322 734 67509	RST SM 0805 RC11 75R PM1 T
3008	2322 730 61479	RES 47R 0805 SMD RC-11 T
3009	2322 734 67509	RST SM 0805 RC11 75R PM1 T
3010	2322 730 61479	RES 47R 0805 SMD RC-11 T
3011	2322 734 67509	RST SM 0805 RC11 75R PM1 T
3012	2322 730 61471	RST SM 0805 RC11 470R PM5 R
3013	2322 730 61471	RST SM 0805 RC11 470R PM5 R
3014	2322 730 61471	RST SM 0805 RC11 470R PM5 R
3015	2322 730 61471	RST SM 0805 RC11 470R PM5 R
3016	2322 730 61479	RES 47R 0805 SMD RC-11 T
3017	2322 734 67509	RST SM 0805 RC11 75R PM1 T
3018	2322 730 61222	RST SM 0805 RC11 2K2 PM5 R
3019	2322 730 61479	RES 47R 0805 SMD RC-11 T
3020	2322 734 67509	RST SM 0805 RC11 75R PM1 T
3021	2322 730 61479	RES 47R 0805 SMD RC-11 T
3022	2322 734 67509	RST SM 0805 RC11 75R PM1 T
3023	2322 730 61222	RST SM 0805 RC11 2K2 PM5 R
3103	2138 660 00033	NTC THERMISTOR 8R PM15 SCK-0810
3104	2138 105 00337	1W 100K RSS (T)
3105	2138 105 00337	1W 100K RSS (T)
3106	2120 105 92436	MET FLM RSS 3W 47K PM5
3107	2322 241 82204	METGLAZ RST VR25 220K PM1

Back

Forward

Spare Parts list

Go to cover page

ITEM	CODENUMBER	DESCRIPTION
3259	2138 116 11304	RST MFLM MF50S A 130K PM1 A
3260	2138 116 11803	RST MFLM MF50S A 18K PM1 A
3261	2138 116 11304	RST MFLM MF50S A 130K PM1 A
3262	2138 116 11803	RST MFLM MF50S A 18K PM1 A
3263	2138 116 11304	RST MFLM MF50S A 130K PM1 A
3264	2138 116 11803	RST MFLM MF50S A 18K PM1 A
3269	2138 116 11304	RST MFLM MF50S A 130K PM1 A
3270	2138 116 15802	RST MFLM MF50S A 5K6 PM1 A
3271	2138 116 11304	RST MFLM MF50S A 130K PM1 A
3272	2138 116 15802	RST MFLM MF50S A 5K6 PM1 A
3273	2138 116 11304	RST MFLM MF50S A 130K PM1 A
3274	2138 116 15802	RST MFLM MF50S A 5K6 PM1 A
3275	2138 116 11304	RST MFLM MF50S A 130K PM1 A
3276	2138 116 15802	RST MFLM MF50S A 5K6 PM1 A
3277	2138 116 12209	RST MFLM MF50S A 22R PM1 A
3278	2138 116 12209	RST MFLM MF50S A 22R PM1 A
3280	2138 116 12209	RST MFLM MF50S A 22R PM1 A
3281	2138 116 12209	RST MFLM MF50S A 22R PM1 A
3283	2138 116 12209	RST MFLM MF50S A 22R PM1 A
3284	2138 116 12209	RST MFLM MF50S A 22R PM1 A
3286	2138 116 12209	RST MFLM MF50S A 22R PM1 A
3287	2138 116 12209	RST MFLM MF50S A 22R PM1 A
3292	2138 116 16809	RST MFLM MF50S A 68R PM1 A
3293	2138 116 16809	RST MFLM MF50S A 68R PM1 A
3295	2138 116 16809	RST MFLM MF50S A 68R PM1 A
3296	2138 116 16809	RST MFLM MF50S A 68R PM1 A
3301	2138 112 03008	NETWORK RESISTOR
3302	2138 101 13101	RST CRB CR12 A 100R PM5 A
3303	2322 730 61103	RES 10K RC-11 SMD 0805 T
3304	2138 101 13101	RST CRB CR12 A 100R PM5 A
3305	2138 101 13104	RST CRB CR12 A 100K PM5 A
3307	2322 730 61103	RES 10K RC-11 SMD 0805 T
3308	2322 730 61103	RES 10K RC-11 SMD 0805 T
3309	2138 101 13103	RST CRB CR12 A 10K PM5 A
3310	2322 730 61472	RST SM 0805 RC11 4K7 PM5 R
3311	2138 101 13104	RST CRB CR12 A 100K PM5 A
3312	2138 101 13101	RST CRB CR12 A 100R PM5 A
3313	2138 101 13101	RST CRB CR12 A 100R PM5 A
3314	2138 101 13101	RST CRB CR12 A 100R PM5 A
3315	2138 101 13101	RST CRB CR12 A 100R PM5 A
3316	2322 730 61472	RST SM 0805 RC11 4K7 PM5 R
3317	2138 101 13333	RST CRB CR12 A 33K PM5 A
3318	2322 730 61103	RES 10K RC-11 SMD 0805 T
3319	2138 116 11003	RST MFLM MF50S A 10K PM1 A
3320	2138 101 13103	RST CRB CR12 A 10K PM5 A
3321	2138 101 13101	RST CRB CR12 A 100R PM5 A
3322	2138 116 18202	RST MFLM MF50S A 8K2 PM1 A
3323	2322 730 61104	RES 100K RC-11 SMD 0805 T
3325	2322 730 61472	RST SM 0805 RC11 4K7 PM5 R
3326	2138 101 13472	RST CRB CR12 A 4K7 PM5 A
3327	2138 101 13153	RST CRB CR12 A 15K PM5 A
3328	2138 116 12701	RST MFLM MF50S A 270R PM1 A
3329	2138 116 11509	RST MFLM MF50S A 15R PM1 A
3330	2138 101 13153	RST CRB CR12 A 15K PM5 A
3331	2138 101 13472	RST CRB CR12 A 4K7 PM5 A
3332	2322 730 61103	RES 10K RC-11 SMD 0805 T
3333	2322 730 61103	RES 10K RC-11 SMD 0805 T
3334	2138 101 13101	RST CRB CR12 A 100R PM5 A
3335	2138 101 13101	RST CRB CR12 A 100R PM5 A
3337	2138 101 13222	RST CRB CR12 A 2K2 PM5 A
3338	2138 101 13222	RST CRB CR12 A 2K2 PM5 A
3339	2322 730 61103	RES 10K RC-11 SMD 0805 T
3340	2322 730 61103	RES 10K RC-11 SMD 0805 T
3341	2322 730 61103	RES 10K RC-11 SMD 0805 T
3342	2322 730 61103	RES 10K RC-11 SMD 0805 T
3343	2138 101 13103	RST CRB CR12 A 10K PM5 A
3351	2322 730 61105	RES 1M RC-11 SMD 0805 T
3352	2138 101 13229	RST CRB CR12 A 22R PM5 A
3353	2138 101 13229	RST CRB CR12 A 22R PM5 A
3354	2138 101 13101	RST CRB CR12 A 100R PM5 A
3355	2138 101 13101	RST CRB CR12 A 100R PM5 A
3393	2322 730 61472	RST SM 0805 RC11 4K7 PM5 R
3394	2322 730 61103	RES 10K RC-11 SMD 0805 T
3395	2322 730 61472	RST SM 0805 RC11 4K7 PM5 R
3396	2322 730 61103	RES 10K RC-11 SMD 0805 T
3397	2138 101 13472	RST CRB CR12 A 4K7 PM5 A
3398	2138 101 13101	RST CRB CR12 A 100R PM5 A
3401	2322 730 61103	RES 10K RC-11 SMD 0805 T
3402	2322 730 61222	RST SM 0805 RC11 2K2 PM5 R
3403	2322 730 61002	RST SM 0805 JUMP MAX 0R05 T
3404	2138 101 13471	RST CRB CR12 A 470R PM5 A
3405	2322 730 61002	RST SM 0805 JUMP MAX 0R05 T
3421	2138 116 12203	RST MFLM MF50S A 22K PM1 A
3422	2138 101 13471	RST CRB CR12 A 470R PM5 A
3423	2322 730 61472	RST SM 0805 RC11 4K7 PM5 R
3424	2138 101 13101	RST CRB CR12 A 100R PM5 A
3425	2322 730 61103	RES 10K RC-11 SMD 0805 T
3426	2138 101 13101	RST CRB CR12 A 100R PM5 A
3427	2138 101 13101	RST CRB CR12 A 100R PM5 A
3428	2138 101 13225	RST CRB CR12 A 2M2 PM5 A
3429	2322 730 61155	SMD R0805 1M5 PM5
3430	2322 730 61101	RST SM 0805 RC11 100R PM5 R
3431	2322 730 61332	RES 3K3 0805 SMD
3432	2138 116 15101	RST MFLM MF50S A 510R PM1 A
3433	2138 116 12802	RST MFLM MF50S A 2K8 PM1 A
3434	2322 730 61472	RST SM 0805 RC11 4K7 PM5 R
3441	2138 116 15803	RST MFLM MF50S A 50K PM1 A
3442	2322 241 82204	METGLAZ RST VR25 220K PM1
3443	2138 101 13683	RST CRB CR12 A 68K PM5 A
3444	2322 730 61002	RST SM 0805 JUMP MAX 0R05 T
3445	2322 730 61564	SMD R0805 50K PM5
3448	2322 730 61123	RES 12K RC-11 SMD 0805 T
3450	2306 204 03828	RST MFLM NFR25 1/4W 8R2 PM5
3451	2322 730 61122	RST SMC 0805 RC11 1K2 PM5 T
3456	2306 204 03828	RST MFLM NFR25 1/4W 8R2 PM5
3457	2322 730 61122	RST SMC 0805 RC11 1K2 PM5 T
3458	2138 112 73471	CARBST FLM CR25 47R PM5
3462	2138 101 13103	RST CRB CR12 A 10K PM5 A
3464	2322 730 61153	RST SM 0805 RC11 15K PM5 R
3465	2138 101 13103	RST CRB CR12 A 10K PM5 A
3466	2138 101 13103	RST CRB CR12 A 10K PM5 A
3467	2322 730 61472	RST SM 0805 RC11 4K7 PM5 R
3468	2138 101 13472	RST CRB CR12 A 4K7 PM5 A
3469	2138 112 73473	CARBST FLM CR25 47K PM5
3470	2138 101 13221	RST CRB CR12 A 220R PM5 A
3471	2138 101 13473	RST CRB CR12 A 47K PM5 A
3472	2138 116 17503	RST MFLM MF50S A 75K PM1 A
3473	2138 116 11003	RST MFLM MF50S A 10K PM1 A
3474	2138 116 11504	RST MFLM MF50S A 150K PM1 A
3475	2138 112 73103	CARBST FLM CR25 10K PM5
3476	2322 241 81005	METGLAZ RST VR25 1M PM1
3491	2322 730 61473	RST SM 0805 RC11 47K PM5 R
3492	2322 730 61473	RST SM 0805 RC11 47K PM5 R
3493	2138 101 13101	RST CRB CR12 A 100R PM5 A
3494	2322 730 61101	RST SM 0805 RC11 100R PM5 R
3495	2138 101 13101	RST CRB CR12 A 100R PM5 A
3501	2138 105 00335	5W 680R RSM 6E
3502	2138 105 00334	5W 2K2 RSM 6E
3503	2138 101 13479	RST CRB CR12 A 47R PM5 A
3504	2138 101 13103	RST CRB CR12 A 10K PM5 A
3505	2138 105 00335	5W 680R RSM 6E
3506	2138 105 00404	7W 1.5R RSH 6E
3507	2138 116 16809	RST MFLM MF50S A 68R PM1 A
3515	2138 105 00074	TST MOX5W RSM5WL5 150R PM5 B
3516	2138 105 00076	TST MOX5W 330R RSM5
3517	2138 116 14701	RST MFLM MF50S A 470R PM1 A
3518	2138 116 14701	RST MFLM MF50S A 470R PM1 A
3519	2138 116 16809	RST MFLM MF50S A 68R PM1 A
3520	2138 112 73102	CARBST FLM CR25 1K0 PM5 S
3521	2138 116 16809	RST MFLM MF50S A 68R PM1 A
3522	2138 116 14478	RST MFLM MF50S A 47K PM5 A
3523	2306 204 03159	MET FLM RST NFR25 15R PM5
3524	2306 204 03159	MET FLM RST NFR25 15R PM5
3525	2138 112 73471	CARBST FLM CR25 470R PM5
3527	2322 730 61103	RES 10K RC-11 SMD 0805 T
3528	2138 101 13101	RST CRB CR12 A 100R PM5 A
3529	2322 730 61103	RES 10K RC-11 SMD 0805 T

Spare Parts list

◀ Go to cover page

ITEM	CODENUMBER	DESCRIPTION
3541	2138 101 13121	RST CRB CR12 A 120R PM5 A
3542	2138 101 13103	RST CRB CR12 A 10K PM5 A
3544	2138 116 11009	RST MFLM MF50S A 10R PM1 A
3545	2138 105 00085	RST MOX 7W RSS S 33R PM5
3546	2138 101 33479	RST MFLM NFR25H 47R PM5
3551	2306 204 03108	RST FUSE NFR25 S 1R0 PM5 A
3552	2306 204 03108	RST FUSE NFR25 S 1R0 PM5 A
3553	2138 116 14702	RST MFLM MF50S A 4K7 PM1 A
3554	2138 116 11003	RST MFLM MF50S A 10K PM1 A
3555	2322 730 61103	RES 10K RC-11 SMD 0805 T
3556	2322 730 61202	RES 2K RC-11 SMD 0805 T
3566	2138 101 13472	RST CRB CR12 A 4K7 PM5 A
3569	2322 207 33108	MET FLM RST NFR25H 1R0 PM5 T
3570	2138 116 12202	RST MFLM MF50S A 2K2 PM1 A
3571	2138 112 73471	CARBST FLM CR25 470R PM5
3572	2138 112 73471	CARBST FLM CR25 470R PM5
3576	2138 116 12202	RST MFLM MF50S A 2K2 PM1 A
3577	2322 207 33108	MET FLM RST NFR25H 1R0 PM5 T
3578	2138 116 14709	RST MFLM MF50S A 47R PM1 A
3579	2138 112 73188	RES CR25 1/4W 1R8
3580	2138 116 04228	RST MFLM MF50S A 2R2 PM5 A
3581	2138 116 12201	RST MFLM MF50S A220R PM1 A
3582	2138 112 73188	RES CR25 1/4W 1R8
3586	2138 101 13102	RST CRB CR12 A 1K PM5 A
3587	2138 116 17502	RST MFLM MF50S A 7K5 PM1 A
3588	2138 112 73152	CARBST FLM CR25 1K5 PM5
3589	2138 116 12202	RST MFLM MF50S A 2K2 PM1 A
3590	2322 205 33479	MET FLM RST NFR25 47R PM5PM5 T
3591	2322 205 33479	MET FLM RST NFR25 47R PM5PM5 T
3592	2138 116 14701	RST MFLM MF50S A 470R PM1 A
3593	2138 116 15609	RST MFLM MF50S A 56R PM1 A
3594	2138 660 00029	NTC RST 300R
3601	2322 242 13224	METGLAZ RST A VR37 220K PM5 T
3605	2322 242 13104	METGLAZ RST A VR37 100K
3606	2322 242 13105	METGLAZ RST A VR37 1M PM5 T
3607	2322 242 13105	METGLAZ RST A VR37 1M PM5 T
3608	2138 112 73332	CARBST FLM CR25 3K3 PM5
3609	2120 101 28152	CARBST COMP 1/2W 1K5 PM10
3610	2322 730 91002	RST SM 0805 JUMP MAX 0R05 T
3611	2138 101 13393	RST CRB CR12 A 39K PM5 A
3612	2322 730 61223	RES 22K 0805 SMD
3613	2138 116 14701	RST MFLM MF50S A 470R PM1 A
3614	2322 730 61104	RES 100K RC-11 SMD 0805 T
3615	2138 112 73392	CARBST FLM CR25 3K3 PM5
3616	2322 242 13105	METGLAZ RST A VR37 1M PM5 T
3617	2120 101 28222	RST CMP ERC12 A 2K2 PM10 A
3618	2322 730 91002	RST SM 0805 JUMP MAX 0R05 T
3622	2322 730 61104	RES 100K RC-11 SMD 0805 T
3623	2138 101 13103	RST CRB CR12 A 10K PM5 A
3624	2322 730 61104	RES 100K RC-11 SMD 0805 T
3625	2138 101 13103	RST CRB CR12 A 10K PM5 A
3626	2322 730 61104	RES 100K RC-11 SMD 0805 T
3627	2138 101 13103	RST CRB CR12 A 10K PM5 A
3628	2322 730 61104	RES 100K RC-11 SMD 0805 T
3629	2138 101 13103	RST CRB CR12 A 10K PM5 A
3630	2322 730 61104	RES 100K RC-11 SMD 0805 T
3631	2138 101 13103	RST CRB CR12 A 10K PM5 A
3632	2322 730 61104	RES 100K RC-11 SMD 0805 T
3633	2138 101 13103	RST CRB CR12 A 10K PM5 A
3634	2138 112 73222	CARBST FLM CR25 2K2 PM5 T
3652	2322 730 61472	RST SM 0805 RC11 4K7 PM5 R
3653	2138 112 73129	CARBST FLM R25 12R PM5
3654	2322 730 61154	RST SM 0805 RC11 150K PM5 R
3656	2322 730 61472	RST SM 0805 RC11 4K7 PM5 R
3657	2322 730 61472	RST SM 0805 RC11 4K7 PM5 R
3658	2138 101 13332	RST CRB CR12 A 3K3 PM5 A
3659	2138 116 15602	RST MFLM MF50S A 5K8 PM1 A
3660	2322 730 61562	RES 5.6K RC-11 SMD 0805 T
3661	2322 730 61479	RES 47R 0805 SMD RC-11 T
3662	2322 730 61472	RST SM 0805 RC11 4K7 PM5 R
3663	2322 734 64702	SMD RST 0805 4K7 PM1
3664	2322 730 61332	RES 3K3 0805 SMD
3665	2322 730 61103	RES 10K RC-11 SMD 0805 T
3666	2322 730 61105	RES 1M RC-11 SMD 0805 T
3667	2322 730 61472	RST SM 0805 RC11 4K7 PM5 R

◀ Back

Forward ▶

Spare Parts list

◀ Go to cover page

ITEM	CODENUMBER	DESCRIPTION
3751	2322 730 61433	RES 43K 0805 SMD
3752	2322 730 61102	RST SMC 0805 RC11 1K PM5 T
3753	2138 116 15603	RST MFLM MF50S A 56K PM1 A
3754	2138 101 13224	RST CRB CR12 A 220K PM5 A
3755	2322 730 61123	RES 12K RC-11 SMD 0805 T
3756	2322 730 61683	RES 68K RC-11 SMD 0805 T
3757	2120 101 28478	CARBST COMP 1/2W 47R PM10
3760	2322 734 61509	RST SM 0805 RC11 75R PM1 T
3763	2322 730 61101	RST SM 0805 RC11 100R PM5 R
3764	2322 730 61105	RES 1M RC-11 SMD 0805 T
3765	2322 730 61829	RST SM 0805 RC11 82R PM5 R
3766	2322 730 61101	RST SM 0805 RC11 100R PM5 R
3767	2322 730 61479	RES 47R 0805 SMD RC-11 T
3768	2322 730 61109	RES 10R 0805 SMD
3769	2322 730 61109	RES 10R 0805 SMD
3770	2138 105 00073	RST MOX 1W RSS S 680R PM5 B
3771	2322 730 61479	RES 47R 0805 SMD RC-11 T
3772	2322 730 61241	RST 240R 0805 SMD
3773	2322 730 61153	RST SM 0805 RC11 15K PM5 R
3774	2322 730 61271	RST 270R 0805 SMD T
3775	2322 730 61332	RES 3K3 0805 SMD
3776	2322 730 61154	RST SM 0805 RC11 150K PM5 R
3777	2322 730 61109	RES 10R 0805 SMD
3778	2322 730 61151	RST SM 0805 RC11 150R PM5 R
3779	2322 730 61105	RES 1M RC-11 SMD 0805 T
3780	2322 730 61473	RST SM 0805 RC11 47K PM5 R
3781	2322 730 61433	RES 43K 0805 SMD
3782	2322 730 61102	RST SMC 0805 RC11 1K PM5 T
3783	2138 116 15603	RST MFLM MF50S A 56K PM1 A
3784	2138 101 13224	RST CRB CR12 A 220K PM5 A
3785	2322 730 61123	RES 12K RC-11 SMD 0805 T
3786	2322 730 61823	SMD R0805 82K PM5
3787	2120 101 28479	CARBST COMP 1/2W 47R PM10
3790	2322 730 61101	RST SM 0805 RC11 100R PM5 R
3792	2322 730 61103	RES 10K RC-11 SMD 0805 T
3795	2322 730 61182	RES 1K8 0805 SMD
3796	2322 730 61829	RST SM 0805 RC11 82R PM5 R
3797	2322 730 61182	RES 1K8 0805 SMD
3798	2322 730 61829	RST SM 0805 RC11 82R PM5 R
3799	2322 730 61182	RES 1K8 0805 SMD
3801	2322 730 61472	RST SM 0805 RC11 4K7 PM5 R
3802	2322 730 61562	RES 5.6K RC-11 SMD 0805 T
3803	2322 730 61472	RST SM 0805 RC11 4K7 PM5 R
3804	2322 730 61105	RES 1M RC-11 SMD 0805 T
3805	2322 730 61103	RES 10K RC-11 SMD 0805 T
3806	2322 730 61331	RST SM 0805 RC11 330R PM5 T
3807	2322 730 61153	RST SM 0805 RC11 15K PM5 R
3808	2322 730 61123	RES 12K RC-11 SMD 0805 T
3809	2322 730 61224	RST SMD 0805 RC11 220K PM5 R
3811	2322 730 61184	RST SMD 0805 RC11 180K PM5 T
3812	2322 730 61884	RES 680K 0805 SMD
3813	2322 730 61473	RST SM 0805 RC11 47K PM5 R
3815	2322 730 61103	RES 10K RC-11 SMD 0805 T
3816	2322 730 61102	RST SMC 0805 RC11 1K PM5 T
3817	2322 730 61123	RES 10K RC-11 SMD 0805 T
3821	2322 730 61184	RST SMD 0805 RC11 180K PM5 T
3822	2322 730 61684	RES 680K 0805 SMD
3823	2322 730 61473	RST SM 0805 RC11 47K PM5 R
3825	2322 730 61103	RES 10K RC-11 SMD 0805 T
3831	2322 730 61184	RST SMD 0805 RC11 180K PM5 T
3832	2322 730 61684	RES 680K 0805 SMD
3833	2322 730 61473	RST SM 0805 RC11 47K PM5 R
3835	2322 730 61103	RES 10K RC-11 SMD 0805 T
3841	2322 730 61103	RES 10K RC-11 SMD 0805 T
3842	2322 730 61103	RES 10K RC-11 SMD 0805 T
3843	2322 730 61103	RES 10K RC-11 SMD 0805 T
3844	2322 730 61103	RES 10K RC-11 SMD 0805 T
3845	2322 730 61101	RST SM 0805 RC11 100R PM5 R
3846	2322 730 61101	RST SM 0805 RC11 100R PM5 R
3850	2322 730 61471	RST SM 0805 RC11 470R PM5 R
3851	2322 730 61122	RST SMC 0805 RC11 1K2 PM5 T
3852	2322 730 61102	RST SMC 0805 RC11 1K PM5 T
3853	2322 730 61222	RST SM 0805 RC11 2K2 PM5 R
3854	2322 730 61101	RST SM 0805 RC11 100R PM5 R
3855	2322 730 61101	RST SM 0805 RC11 100R PM5 R

◀ Back

Forward ▶

Spare Parts list

Go to cover page

ITEM	CODENUMBER	DESCRIPTION
5721	2422 549 44197	BLM21P221SB-0805 SMD
5722	2422 549 44197	BLM21P221SB-0805 SMD
5728	2422 535 97725	HIGH FREQ. CHOKE 0.22UH PM10
5748	2422 535 97725	HIGH FREQ. CHOKE 0.22UH PM10
5749	2422 549 44197	BLM21P221SB-0805 SMD
5767	3138 168 74511	FERRITE BEAD+COIL C8BR6H6X9.2A
5768	2422 549 42026	IND FXD BEAD EMI 100MHZ 50E A
5772	2422 535 97069	COIL AU7 K 0305
5778	2422 535 97725	HIGH FREQ. CHOKE 0.22UH PM10
5779	2422 549 44197	BLM21P221SB-0805 SMD
5795	2422 549 44197	BLM21P221SB-0805 SMD
5796	2422 549 44197	BLM21P221SB-0805 SMD
5801	2422 549 44197	BLM21P221SB-0805 SMD
5856	2422 535 97069	COIL AU7 K 0305
5857	2422 535 97069	COIL AU7 K 0305
5858	2422 549 40662	FERRITE BEAD 0.7UH
5864	2422 535 97069	COIL AU7 K 0305
5875	3138 168 74511	FERRITE BEAD+COIL C8BR6H6X9.2A
5879	2422 549 44197	BLM21P221SB-0805 SMD
5880	2422 549 44197	BLM21P221SB-0805 SMD
5885	2422 549 44197	BLM21P221SB-0805 SMD
5886	2422 549 44197	BLM21P221SB-0805 SMD
5888	2422 535 97069	COIL AU7 K 0305
5889	2422 549 44197	BLM21P221SB-0805 SMD
5891	2422 549 44197	BLM21P221SB-0805 SMD
6101	9319 002 63671	BRIDGE GY26E
6104	9337 037 00133	DIODE BYV26E
6109	3198 010 27581	DIODE BZX79C 7V5
6111	3198 010 21591	DIODE BZX79-C15 (UAW)
6112	9337 037 00133	DIODE BYV26E
6113	3198 010 10071	DIODE BAV21 (UAW)
6114	3198 010 10531	SMD DIODE BAV103
6115	3198 010 10071	DIODE BAV21 (UAW)
6116	9337 516 60683	DIODE RGP10D (GI)
6125	3198 010 10011	DIODE 1N4148 (UAW)
6131	9322 126 36682	DIODE 31DF6 6E
6132	3198 010 21591	DIODE BZX79-C15 (UAW)
6133	9322 126 36682	DIODE 31DF6 6E
6134	9322 081 87683	DIODE BYW98-200
6135	9322 081 87683	DIODE BYW98-200
6137	9322 081 87683	DIODE BYW98-200
6139	9322 081 87683	DIODE BYW98-200
6140	9338 903 90682	DIO REC EGP20D B
6144	9337 037 00133	DIODE BYV26E
6145	3198 010 10071	DIODE BAV21 (UAW)
6152	3198 010 26881	DIODE BZX79-C6V8 (UAW)
6160	9339 139 10115	SMD DIODE BAS32L
6161	3198 010 10071	DIODE BAV21 (UAW)
6162	3198 010 10531	SMD DIODE BAV103
6191	9334 979 50683	DIODE RGP10J (GI)
6191	3198 010 10011	DIODE 1N4148 (UAW)
6192	3198 010 10071	DIODE BAV21 (UAW)
6192	3198 010 10071	DIODE BAV21 (UAW)
6193	3198 010 10071	DIODE BAV21 (UAW)
6194	3198 010 10011	DIODE 1N4148 (UAW)
6201	9331 668 90113	DIODE BZX79-B12V
6202	9322 147 29673	DIODE BZX55-B2V4 (UAW)
6203	3198 010 10011	DIODE 1N4148 (UAW)
6204	3198 010 10011	DIODE 1N4148 (UAW)
6205	3198 010 10011	DIODE 1N4148 (UAW)
6206	3198 010 10011	DIODE 1N4148 (UAW)
6207	3198 010 25681	DIODE BZX79-C5V6 (UAW)
6208	3198 010 25681	DIODE BZX79-C5V6 (UAW)
6301	9339 139 10115	SMD DIODE BAS32L
6302	3198 010 10011	DIODE 1N4148 (UAW)
6391	9332 153 70215	SMD DIODE BAV99
6392	9332 153 70215	SMD DIODE BAV99
6421	3198 010 10011	DIODE 1N4148 (UAW)
6422	9339 577 60683	DIODE SB140 (GI)
6423	9339 139 10115	SMD DIODE BAS32L
6424	3198 010 10011	DIODE 1N4148 (UAW)
6426	3198 010 10011	DIODE 1N4148 (UAW)
6462	3198 010 23091	DIODE BZX79C30V
6463	9339 139 10115	SMD DIODE BAS32L
6464	3198 010 25181	DIODE BZX79-C5V1 (UAW)

Back

Forward

Spare Parts list

Go to cover page

ITEM	CODENUMBER	DESCRIPTION
7121	9322 145 76882	IC STR8666 (LF1352)
7130	9322 140 14667	PHOTOCOUPLER TCET1103G 4P
7140	9335 358 00892	TRANS. BD438 B
7141	9322 092 65685	Trans. MUN221JT1
7143	9322 092 00887	IC L490V6 3P
7144	9337 739 70687	MOSFET IRF640
7148	9340 039 60128	TRANS BSN254A
7147	9322 092 65685	Trans. MUN221JT1
7148	3198 010 42081	TRANS BC848C (UAW)
7151	3198 020 43541	TRANS BC337-40 (UAW) R
7155	9337 711 00886	IC TL431CLPRP 3P
7161	3198 020 43561	TRANS BC338 (UAW)
7162	9322 092 65685	Trans. MUN221JT1
7163	3198 010 42081	TRANS BC848C (UAW)
7191	3198 020 40161	TRANS BC558C (UAW)
7191	3198 020 43561	TRANS. BC338-40
7201	9322 139 96882	IC LM61B1Z 3P
7203	9333 935 10602	IC LM358N 8P (PHILIPS)
7204	9337 681 30112	IC PCF8591P 16P
7205	9352 298 30112	IC TDA4847/N1 16P
7206	9351 920 50112	IC TDA7073A/N3 16P
7207	9351 920 50112	IC TDA7073A/N3 16P
7208	9351 920 50112	IC TDA7073A/N3 16P
7301	9352 644 29112	IC P83C380AER/079 42P
7302	3198 010 42201	TRANS BC858C (UAW)
7303	3198 010 42081	TRANS BC848C (UAW)
7351	9352 608 01112	IC PDIUSBD11N 16P
7363	9334 008 10682	IC MC7812CT 3P
7364	9339 208 10682	IC L7808CV 3P
7391	9322 092 65685	Trans. MUN221JT1
7392	3198 010 42201	TRANS BC858C (UAW)
7401	3198 020 43461	TRANS BC328 (UAW)
7402	9322 092 65685	Trans. MUN221JT1
7404	9332 826 60652	IC HEF4053BP 16P
7421	9352 623 32112	IC TDA4856/V2 32P
7422	3198 020 43561	TRANS BC338 (UAW)
7423	3198 020 43461	TRANS BC328 (UAW)
7424	9322 092 65685	Trans. MUN221JT1
7425	3198 020 40081	TRANS BC848C (UAW)
7426	3198 020 40161	TRANS BC558C (UAW)
7427	3198 010 42201	TRANS BC858C (UAW)
7461	9332 377 80128	TRANS BC546B (UAW)
7462	3198 020 40081	TRANS BC546C (UAW)
7463	3198 020 40081	TRANS BC546C (UAW)
7464	3198 020 43021	TRANS BF422 (UAW)
7465	3198 020 43011	TRANS BF422 (UAW)
7466	9322 092 65685	Trans. MUN221JT1
7491	9322 098 98682	IC ST24LC12BB6 8P
7501	9340 005 40115	TRANS BSP126
7502	9319 001 87687	TRANS. 25C3998
7503	9322 057 03687	TRANS BD533
7504	9322 057 03687	TRANS BD533
7505	9333 935 10602	IC LM358N 8P (PHILIPS)
7541	9322 118 29687	FET POW 25J448
7542	9322 048 22682	TRANS 2SC2344E (SANYO)
7543	9322 048 22682	TRANS 2SA1011E
7544	3198 010 42201	TRANS BC858C (UAW)
7545	3198 020 43011	TRANS BF422 (UAW)
7566	9322 092 65685	Trans. MUN221JT1
7567	9319 002 34682	IC STV8379 7P
7586	9333 935 10602	IC LM358N 8P (PHILIPS)
7587	3198 020 43841	TRANS BC839 (UAW)
7588	3198 020 43811	TRANS BC838 (UAW)
7601	9332 715 70127	TRANSISTOR BUX87
7602	3198 010 42081	TRANS BC848C (UAW)
7603	3198 010 42081	TRANS BC848C (UAW)
7621	9337 739 70687	MOSFET IRF640
7622	9322 145 62667	TRANS SLA5058
7628	9322 092 65685	Trans. MUN221JT1
7629	9322 092 65685	Trans. MUN221JT1
7630	9322 092 65685	Trans. MUN221JT1
7631	9322 092 65685	Trans. MUN221JT1
7632	9322 092 65685	Trans. MUN221JT1
7633	9322 092 65685	Trans. MUN221JT1
7651	9322 121 52682	IC L490A 16P
7652	9322 090 11673	SMD BC548C-AT
7653	3198 010 42201	TRANS BC858C (UAW)
7654	3198 010 42081	TRANS BC848C (UAW)
7671	9340 039 60128	TRANS BSN254A
7672	9319 001 79687	IRF740 POWER MOS-FET
7673	9322 124 00687	FET POW STUBNA80 (ST00) L
7674	3198 020 40081	TRANS BC548C (UAW)
7675	9322 106 11678	IC LE33CZ-AP 3P
7701	9337 148 40653	IC 74HC4053D
7702	9337 148 40653	IC 74HC4053D
7703	9337 711 00886	IC TL431CLPRP 3P
7704	9322 128 46862	IC MS2742SP 36P

Back

Forward

ITEM	CODENUMBER	DESCRIPTION
7705	9340 350 10126	TRANS BFQ131A
7706	9340 350 10126	TRANS BFQ131A
7707	9340 350 10126	TRANS BFQ131A
7708	9337 140 40653	IC 74HC780 14P
7711	9340 561 61127	IC CR6927L 12P
7717	9340 350 10126	TRANS BFQ131A
7718	9340 350 20128	TRANS BFQ151
7719	3198 020 43011	TRANS BF422 (UAW)
7720	3198 020 43011	TRANS BF422 (UAW)
7727	9334 530 30682	IC MC7905CT 3P
7737	9340 350 10126	TRANS BFQ131A
7738	9340 350 20128	TRANS BFQ151
7739	3198 020 43011	TRANS BF422 (UAW)
7740	3198 020 43011	TRANS BF422 (UAW)
7767	9340 350 10126	TRANS BFQ131A
7768	9340 350 20128	TRANS BFQ151
7769	3198 020 43011	TRANS BF422 (UAW)
7770	3198 020 43011	TRANS BF422 (UAW)
7801	9338 368 30668	IC TL072CDR SO-8P
7803	3198 020 43021	TRANS BF423 (UAW)
7804	3198 020 43021	TRANS BF423 (UAW)
7805	3198 020 43021	TRANS BF423 (UAW)
7806	9338 516 60118	IC PCF8574AT SO-16P
7807	3198 010 42081	TRANS BC848C (UAW)
7808	3198 020 43021	TRANS BF423 (UAW)
7809	3198 020 43021	TRANS BF423 (UAW)
7810	3198 020 43021	TRANS BF423 (UAW)
7855	8236 274 35561	IC L5C4568P2
7856	3198 010 42081	TRANS BC848C (UAW)
7857	9322 092 65685	Trans. MUN221JT1
7859	9337 144 20653	IC 74HC4068D SO-14P
7861	8236 274 34991	LM61B1M (SOT-23)
2311	2038 035 50227	ELECAP SS 220U 10V 6*7T
2312	2038 302 50212	POLCAP 100V 100N PM5 2E T
2313	2238 861 15229	CAP 22PF 0805 SMD NPO
2314	2238 861 15229	CAP 22PF 0805 SMD NPO
2315	2238 580 16614	CER2 0805 X7R 50V 1N PM10
2316	2038 035 50227	ELECAP SS 220U 10V 6*7T
2317	2038 034 56109	ELCAP S 50V 100F PM20 2E
2336	2038 302 50095	MEF CAP 100V 100N PM10 2E
2337	2238 861 15229	CAP 22PF 0805 SMD NPO
2338	2238 861 15229	CAP 22PF 0805 SMD NPO
2339	2238 580 16627	CER2 0805 X7R 50V 10N PM10 R
2351	2238 910 15649	CER2 0805 X7R 25V 100N CO
2352	2238 861 15339	CAP 33PF 0805 SMD NPO
2353	2238 861 15339	CAP 33PF 0805 SMD NPO
2354	2038 034 56109	ELCAP S 50V 100F PM20 2E
2355	2038 034 56109	ELCAP S 50V 100F PM20 2E
2361	2038 031 35331	ELCAP VT 16V 330UF PM20 2E T
2362	2038 031 35101	ELCAP VT 16V 100UF PM20 2E T
2391	2238 910 15649	CER2 0805 X7R 25V 100N CO
2392	2238 861 15101	CER2 0805 NPO 50V 100P
2401	2038 302 50095	MEF CAP 100V 100N PM10 2E
2421	2038 302 50095	MEF CAP 100V 100N PM10 2E
2422	2038 302 50121	MEF CAP 100V 150N 2E PM10
2423	2020 552 90607	CERC DC NPO 50V 220P PM5 2E T
2424	2238 910 15649	CER2 0805 X7R 25V 100N CO
2425	2038 034 53102	ELCAP S 16V 1000UF PM20 2E
2426	2020 552 90594	CERC DC NPO 50V 22P PM5 2E T
2431	2038 302 50212	POLCAP 100V 100N PM5 2E T
2432	2038 301 50186	PPN 100V 8N2 PM5 T
2433	2038 302 50218	MEF CAP 10N 100V PM2 2E
2434	2038 301 50157	CAP PP PPN 100V S 5N6 PM2 A
2435	2038 301 50186	PPN 100V 8N2 PM5 T
2441	2038 301 50191	PPN 100V 5N3 PM2 T
2442	2238 861 15471	CMC 0805 NPO 470P 50V J
2443	2238 910 15645	CAP 47NF SMD 0805 X7R
2444	2238 910 15645	CAP 47NF SMD 0805 X7R
2445	2038 034 53479	ECAP S 16V 47UF M 2E T
2446	2038 302 50099	POLCAP 100V 470N PM10 2E
2456	2038 034 53479	ECAP S 16V 47UF M 2E T
2457	2032 301 90145	PPN CAP 220N 250V PM15 5E
2462	2238 861 15221	MLCC 0805 NPO 220P 14B 9
2463	2038 034 53479	ECAP S 16V 47UF M 2E T
2464	2238 580 16624	CER2 0805 X7R 5N6 50V +/-10%
2491	2038 302 50085	MEF CAP 100V 100N PM10 2E
2492	2038 302 50085	CER2 0805 NPO 50V 100P
2493	2238 861 15101	CER2 0805 NPO 50V 100P
2501	2038 301 95005	ELCAP S 160V 1UF PM20 2E T
2502	2038 026 50007	NON-POLAR CAP 160V 1U C
2503	2038 302 50095	MEF CAP 100V 100N PM10 2E
2504	2020 558 90561	CERC CAP RR 2KV 220P PM10 B
2507	2020 558 90581	CERC CAP RR 2KV 220P PM10 B
2508	2020 558 90581	CERC CAP RR 2KV 220P PM10 B
2515	2020 558 90557	POLCAP RR 1K50V IN PM10
2516	2038 302 50099	ELCAP 100V 470N PM10 2E

Go to cover page

PHILIPS



CM25+ 201P
GENERAL PRODUCT
SPECIFICATION

MICRO PROCESSOR- BASED DIGITAL CONTROL WITH 9 FACTORY PRESETS AND 37 USER MODES TO ENSURE PICTURE CONFIGURATIONS ARE ALWAYS MAINTAINED WHEN SWITCH BETWEEN COMMON VIDEO MODES AND USER DEFINED CUSTOM MODES.

USER FRIENDLY OSD DISPLAY FOR MODE IDENTIFICATION/ADJUSTMENT

DDC1/2B COMMUNICATION CAPABILITY

CUSTOMAX (OPTION) FOR MONITOR CONTROL AND ADJUSTMENT

MAX. RESOLUTION 2048 X 1536 NON-INTERLACED AT 75 HZ

21" 0.24 MM (at center) AG MASK NF PICTURE TUBE

EASY TILT & SWIVEL BASE

FULL RANGE POWER SUPPLY 90-264 VAC

CE ENVIRONMENTAL POLICY

FLAT SQUARE TUBE TO REDUCE LIGHT REFLECTION

POWER MANAGEMENT CAPABILITY

PROVIDE USB HUB & DEVICE FUNCTION (OPTION)

LOW EMISSION TCO 99

MOIRÉ CANCELLATION

AUTO CALIBRATE FUNCTION

CLASS NO

21" AUTO SCAN CMTR-CM25+ 201P

TYPE : 201P 10/00

BRAND : PHILIPS

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32

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1

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2033 100 00424

Back

Forward

Go to cover page

PHILIPS



CONTENTS

1. Foreword

2.0	Product profile
2.1	CRT
2.2	Scanning frequencies
2.3	Video dot rate
2.4	Power input
2.5	Power consumption
2.6	Dimensions
2.7	Weight
2.8	Functions
2.9	Ambient temperature
2.10	Regulatory compliance
3.0	Electrical characteristics
3.1	Interface signals
3.2	Interface
3.2.1	Cable
3.2.2	Adaptor
3.2.3	OSD function control
3.3	Timing requirement
3.3.1	Mode storing capacity
3.3.2	Factory preset timings
3.3.3	Horizontal scanning
3.3.4	Vertical scanning
3.4	Power input connection
3.5	Video amplifiers
3.6	Degaussing
3.7	Requirement for low emission
3.8	Power management
3.9	Display identification
3.10	Customax
4.0	Visual characteristics
4.1	Test conditions
4.2	Resolution
4.3	Brightness

CLASS NO

21" AUTO SCAN CMTR-CM25+ 201P

TYPE : 201P 10/00

BRAND : PHILIPS

8639 000 10329

1999-12-10

NAME R.Y. CHOU

SIGNATURE

32

590

2

10

A4

TY

CHECK

DATE

99-12-10

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2033 100 00424

Back

Forward

PHILIPS



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- 4.4 Flagwaving-jitter
- 4.5 Image size
- 4.5.1 Actual display size
- 4.5.2 Max. scan size
- 4.6 Image centering deviation
- 4.7 Picture shift range
- 4.8 Display dimension stability
- 4.9 Geometric distortions
- 4.10 Picture tilt
- 4.11 Image non-linearity
- 4.12 Misconvergence
- 4.13 Focus check
- 4.14 Brightness uniformity
- 4.15 White color adjustment
- 4.16 White uniformity
- 4.17 Color tracking on full white pattern
- 4.18 Purity
- 4.19 Moire
- 5.0 Mechanical characteristics
- 5.1 Controls
- 5.2 Unit dimension / weight
- 5.3 Tilt and swivel base
- 5.4 Transportation packages
- 5.4.1 Shipping dimension / weight
- 5.4.2 Block unit / palletization
- 6.0 Environmental characteristics
- 6.1 Susceptibility of display to external environment
- 6.2 Transportation tests
- 6.3 Display disturbances from external environment
- 6.4 Display disturbances to external environment...
- 6.4.1 Ionizatic radiation
- 7.0 Reliability
- 7.1 Mean time between failures
- 8.0 Quality assurance requirements
- 8.1 Acceptance test
- 9.0 Serviceability

CLASS NO.		21" AUTO SCAN CMTR-CM25+ 201P			
		TYPE : 201P 10/00		8639 000 10329	
		BRAND : PHILIPS			
1999-12-10					
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2838 100 05424

Back

Forward

PHILIPS



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1.0 FOREWORD

This specification describes a 21" high resolution digitally controlled autoscans color monitor with max. resolution up to 2048x1536/75Hz non-interlaced.

2.0 PRODUCT PROFILE

This display monitor unit is a complete color display monitor enclosed in PHILIPS global styling cabinet which has an integrated tilt and swivel base.

2.1 CRT

Type NR. : M51LRY22X62 (MITSUBISHI)
 Dimensions : 21" NF
 Phosphor Pitch (mm) : 0.24
 Phosphor : B22
 Mask : AG
 Deflection angle : 90 deg
 Light transmission : 40%
 Surface of plate : AR Film
 EHT : 27.0 KV
 Useful screen (mm) : 406.1 x 304.6

2.2 Scanning frequencies

Hor. : 30 - 121KHz Ver. : 50 - 160 Hz

CLASS NO.		21" AUTO SCAN CMTR-CM25+ 201P			
		TYPE : 201P 10/00		8639 000 10329	
		BRAND : PHILIPS			
1999-12-10					
NAME R.Y. CHOU	SUPERS	32	590	4	10
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2838 100 05424

Back

Forward

PHILIPS



pin assignments pin no.	
1	Red video input
2	Green video input / Sync on green
3	Blue video input
4	Optional- connected to pin 10
5	Not connected
6	Red video ground
7	Green video ground
8	Blue video ground
9	+5V
10	Sync ground
11	Optional- connected to pin 10
12	Bi-directional data (SDA)
13	H/H+V sync
14	V sync (VCLK)
15	Data clock (SCL)

- 3.2.2 Adaptor 15 pin D-standard (2 rows male) to 15 pin D - sub (female) for Apple Macintosh II use.

pin no	15 Pin D-standard
1	RED GND
2	RED VIDEO
3	COMPOSITE SYNC
4	SYNC GND
5	GREEN VIDEO
6	GREEN GND
7	NC
8	NC
9	BLUE VIDEO
10	NC
11	NC
12	NC
13	BLUE GND
14	NC
15	NC

CLASS NO.		21"AUTO SCAN CMTR-CM25+ 201P		8639 000 10329	
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1999-12-10	NAME R.Y. CHOU	SUPERS	32	590	7
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Back

Forward

PHILIPS



- 3.2.3 Software control functions via OSD/control

- Adjustable functions:

Main Controls
Language
Input signal selection
Zoom
Adjust horizontal
Adjust vertical
Adjust shape
Adjust color
Reset to factory settings
Extra Controls
Close Main Controls
Move selection then "OK"

Language

-Language : multi-language(at least 5 language)

Input

-Input signal selection

Zoom

- Zoom

Adjust horizontal

-Adjust position
-Adjust size

Adjust vertical

-Adjust position
-Adjust size

Adjust shape

-Adjust side curve
Pincushion
Balanced
-Adjust side angles
Trapezoid
Parallelogram
-Rotate image
Rotate

CLASS NO.		21"AUTO SCAN CMTR-CM25+ 201P		8639 000 10329	
TYPE : 201P 10/00		BRAND : PHILIPS			
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TY	CHECK	DATE 99-12-10	Property of PHILIPS ELECTRONICS INDUSTRIES (TAIWAN) LTD.-B.E.	10	A4

Back

Forward

PHILIPS



Adjust color

- 9300°K for general use
- 6500°K for image management
- 5500°K for photoretouch
- User preset

Reset to factory settings

- No
- Yes

Extra Controls

- degauss

1. Adjust

- Adjust convergence
 - moire
 - Horizontal
 - Vertical
- Adjust purity
 - Top left
 - Top right
 - Bottom left
 - Bottom right
- Auto calibrate

3.3 Timing requirement

3.3.1 Mode storing capacity

- (1) Factory preset modes : 39
- (2) User modes : 39
- (3) New modes : 16

3.3.2 Factory preset timings

The factory settings of size and centering are according to the reference timing charts (see fig -8, fig -9)

CLASS NO

21" AUTO SCAN CMTR-CM25+ 201P

TYPE : 201P 10/00

BRAND : PHILIPS

8639 000 10329

1999-12-10

NAME R.Y. CHOU

SUPERS

32

590

9

10

A4

TY

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DATE 99-12-10

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Back

Forward

PHILIPS



MODE NO.	1	2	3	4
RESOLUTION	640 x 350	640 x 480	720 x 400	640 x 480
Dot clock(MHz)	25.175	25.175	28.321	31.500
f _h	31.468 kHz	31.468 kHz	31.468 kHz	37.500 kHz
A (us)	31.778	31.778	31.778	26.667
B (us)	3.813	3.813	3.813	2.032
C (us)	1.907	1.907	1.907	3.810
D (us)	25.422	25.422	25.423	20.317
E (us)	0.636	0.636	0.325	0.508
f _v	70.087 Hz	59.941 Hz	70.084 Hz	75.000 Hz
O (ms)	14.268	16.683	14.268	13.333
P (ms)	0.064	0.064	0.064	0.080
Q (ms)	1.907	1.049	1.112	0.427
R (ms)	11.122	15.253	12.711	12.800
S (ms)	1.175	0.317	0.382	0.026
SYNC. HV	+/-	+/-	+/-	+/-
POLARITY				
SEP. SYNC	Y	Y	Y	Y

MODE NO.	5	6	7	8
RESOLUTION	640 x 480	640x350	800x600	720x400
Dot clock(MHz)	31.500	31.500	40.000	35.500
f _h	37.861 kHz	37.861 kHz	37.879 kHz	37.927 kHz
A (us)	26.413	26.413	26.400	26.366
B (us)	1.270	2.032	3.200	2.028
C (us)	3.810	3.048	2.200	3.042
D (us)	20.317	20.317	20.000	20.282
E (us)	1.016	1.016	1.000	1.014
f _v	72.810 Hz	85.081 Hz	60.317Hz	85.039 Hz
O (ms)	13.735	11.754	16.579	11.759
P (ms)	0.079	0.079	0.106	0.079
Q (ms)	0.528	1.585	0.607	1.107
R (ms)	12.678	9.245	15.840	10.546
S (ms)	0.45	0.845	0.026	0.027
SYNC. HV	+/-	+/-	+/-	+/-
POLARITY				
SEP. SYNC	Y	Y	Y	Y

CLASS NO

21" AUTO SCAN CMTR-CM25+ 201P

TYPE : 201P 10/00

BRAND : PHILIPS

8639 000 10329

1999-12-10

NAME R.Y. CHOU

SUPERS

32

590

10

10

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Back

Forward

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MODE NO.	9	10	11	12
RESOLUTION	640 x 480	800 x 600	800 x 600	1024 x 768
Dot clock(MHz)	36.000	49.500	50.000	65.000
f _h	43.269 kHz	46.875 kHz	48.077 kHz	48.363 kHz
A (us)	23.111	21.333	20.800	20.677
B (us)	1.556	1.616	2.400	2.092
C (us)	2.222	3.232	1.280	2.462
D (us)	17.778	16.162	16.000	15.754
E (us)	1.555	0.323	1.12	0.369
f _v	85.008 Hz	75.000 Hz	72.188 Hz	60.004 Hz
O (ms)	11.763	13.333	13.853	16.666
P (ms)	0.069	0.064	0.125	0.124
Q (ms)	0.578	0.448	0.478	0.600
R (ms)	11.093	12.800	12.480	15.980
S (ms)	0.023	0.021	0.77	0.062
SYNC. H/V	-/-	+/+	+/+	-/-
POLARITY				
SEP. SYNC	Y	Y	Y	Y

MODE NO.	13	14	15	16
RESOLUTION	832 x 624	640 x 480	800 x 600	1024 x 768
Dot clock(MHz)	57.280	40.500	56.250	75.000
f _h	49.722 kHz	50.628 kHz	53.674 kHz	56.478 kHz
A (us)	20.110	19.752	16.631	17.707
B (us)	1.117	1.580	1.136	1.813
C (us)	3.910	1.975	2.702	1.920
D (us)	14.520	15.802	14.222	13.553
E (us)	0.563	0.395	0.569	0.321
f _v	74.546 Hz	100.10 Hz	85.061 Hz	70.069 Hz
O (ms)	13.410	9.995	11.756	14.272
P (ms)	0.060	0.059	0.056	0.016
Q (ms)	0.784	0.435	0.503	0.513
R (ms)	12.550	9.481	11.179	13.599
S (ms)	0.016	0.020	0.018	0.054
SYNC. H/V	+/+	-/-	+/+	-/-
POLARITY				
SEP. SYNC	Y	Y	Y	Y

CLASS NO.

21" AUTO SCAN CMTR-CM25+ 201P

TYPE : 201P 10/00

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1999-12-10

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32

590

11

10

A4

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Back

Forward

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MODE NO.	17	18	19	20
RESOLUTION	1280 x 960	1024 x 768	800 x 600	1280 x 1024
Dot clock(MHz)	108.000	78.750	67.500	108.000
f _h	60.000 kHz	60.023 kHz	63.023 kHz	63.981 kHz
A (us)	16.667	16.660	15.844	15.830
B (us)	1.037	1.219	0.848	1.037
C (us)	2.889	2.235	2.370	2.296
D (us)	11.852	13.003	11.852	11.852
E (us)	0.889	0.203	0.474	0.445
f _v	60.000 Hz	75.029 Hz	100.00 Hz	60.020 Hz
O (ms)	16.667	13.328	9.997	16.661
P (ms)	0.050	0.050	0.047	0.047
Q (ms)	0.600	0.466	0.548	0.594
R (ms)	16.000	12.795	9.387	16.005
S (ms)	0.017	0.017	0.015	0.015
SYNC. H/V	+/+	+/+	+/+	+/+
POLARITY				
SEP. SYNC	Y	Y	Y	Y

MODE NO.	21	22	23	24
RESOLUTION	1152 x 864	1024 x 768	1152 x 870	1152 x 900
Dot clock(MHz)	108.000	94.500	100.000	108.000
f _h	67.500 kHz	68.677 kHz	68.881 kHz	71.809 kHz
A (us)	14.815	14.561	14.560	13.826
B (us)	1.185	1.016	1.260	0.593
C (us)	2.370	2.201	1.440	2.519
D (us)	10.667	10.838	11.520	10.667
E (us)	0.593	0.508	0.32	0.147
f _v	75.000 Hz	84.997 Hz	74.979 Hz	76.150 Hz
O (ms)	13.333	11.765	13.333	13.132
P (ms)	0.044	0.044	0.044	0.111
Q (ms)	0.474	0.524	0.568	0.480
R (ms)	12.800	11.163	12.678	12.533
S (ms)	0.015	0.014	0.043	0.028
SYNC. H/V	+/+	+/+	-/-	+/+
POLARITY				
SEP. SYNC	Y	Y	Y	Y

CLASS NO.

21" AUTO SCAN CMTR-CM25+ 201P

TYPE : 201P 10/00

BRAND : PHILIPS

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1999-12-10

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32

590

12

10

A4

TY

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DATE 99-12-10

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7833 100 05424

Back

Forward

Go to cover page

PHILIPS



MODE NO.	25	26	27	28
RESOLUTION	1600 x 1200	1280 x 1024	1600 x 1200	1792 x 1344
Dot clock(MHz)	162.000	135.00	175.500	204.750
f _h	75.000 kHz	79.978 kHz	81.250 kHz	83.640 kHz
A (us)	13.333	12.504	12.308	11.998
B (us)	1.185	1.087	1.094	0.977
C (us)	1.877	1.837	1.732	1.602
D (us)	9.877	9.481	9.117	8.752
E (us)	0.394	0.119	0.365	0.825
f _v	60.000 Hz	75.024 Hz	65.000 Hz	59.999 Hz
O (ms)	16.667	13.329	15.385	16.667
P (ms)	0.040	0.038	0.037	0.038
Q (ms)	0.613	0.475	0.566	0.550
R (ms)	16.000	12.804	14.769	16.059
S (ms)	0.014	0.012	0.013	0.012
SYNC. H/V	+/+	+/+	+/+	+/+
SEP. SYNC	Y	Y	Y	Y

MODE NO.	29	30	31	32
RESOLUTION	1280 x 960	1656 x 1392	1600 x 1200	1920 x 1440
Dot clock(MHz)	148.500	218.250	189.000	234.000
f _h	85.938 kHz	86.333 kHz	87.500 kHz	90.000 kHz
A (us)	11.636	11.583	11.429	11.111
B (us)	1.077	1.026	1.016	0.889
C (us)	1.508	1.489	1.608	1.470
D (us)	8.620	8.504	8.466	8.205
E (us)	0.431	0.564	0.339	0.547
f _v	85.002 Hz	59.995 Hz	70.000 Hz	60.000 Hz
O (ms)	11.764	16.666	14.286	16.667
P (ms)	0.035	0.035	0.034	0.035
Q (ms)	0.547	0.498	0.526	0.622
R (ms)	11.171	18.124	13.715	16.000
S (ms)	0.011	0.011	0.011	0.012
SYNC. H/V	+/+	+/+	+/+	+/+
POLARITY	Y	Y	Y	Y
SEP. SYNC	Y	Y	Y	Y

CLASS NO.

21" AUTO SCAN CMTR-CM25+ 201P

TYPE : 201P 10/00

BRAND : PHILIPS

8639 000 10329

1999-12-10

NAME R.Y. CHOU

CHECK

DATE 99-12-10

SUPERS 32

590

13

10

A4

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Back

Forward

Go to cover page

PHILIPS



MODE NO.	33	34	35	36
RESOLUTION	1280 x 1024	1600 x 1200	1600 x 1200	1792 x 1344
Dot clock(MHz)	157.500	202.500	229.500	261.000
f _h	91.146 kHz	93.750 kHz	106.250 kHz	106.270 kHz
A (us)	10.971	10.667	9.412	9.410
B (us)	1.016	0.948	0.837	0.828
C (us)	1.422	1.501	1.325	1.349
D (us)	8.127	7.901	6.972	6.856
E (us)	0.406	0.317	0.278	0.367
f _v	85.024 Hz	75.000 Hz	85.000 Hz	74.997 Hz
O (ms)	11.761	13.334	11.765	13.334
P (ms)	0.033	0.032	0.028	0.028
Q (ms)	0.483	0.491	0.433	0.649
R (ms)	11.234	12.800	11.294	12.647
S (ms)	0.011	0.011	0.01	0.01
SYNC. H/V	+/+	+/+	+/+	+/+
POLARITY	Y	Y	Y	Y
SEP. SYNC	Y	Y	Y	Y

MODE NO.	37	38	39
RESOLUTION	2048 x 1536	1920 x 1440	2048 x 1536
Dot clock(MHz)	239.933	297.000	318.915
f _h	95.820 kHz	112.5 kHz	120.450 kHz
A (us)	10.436	8.889	8.302
B (us)	0.900	0.754	0.675
C (us)	0.800	1.185	1.025
D (us)	8.536	6.465	6.402
E (us)	0.200	0.485	0.200
f _v	60.000 Hz	75.000 Hz	75.000 Hz
O (ms)	16.667	13.333	13.333
P (ms)	0.031	0.027	0.025
Q (ms)	0.595	0.498	0.548
R (ms)	16.030	12.800	12.752
S (ms)	0.011	0.008	0.008
SYNC. H/V	+/+	+/+	+/+
POLARITY	Y	Y	Y
SEP. SYNC	Y	Y	Y

CLASS NO.

21" AUTO SCAN CMTR-CM25+ 201P

TYPE : 201P 10/00

BRAND : PHILIPS

8639 000 10329

1999-12-10

NAME R.Y. CHOU

CHECK

DATE 99-12-10

SUPERS 32

590

14

10

A4

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Back

Forward

PHILIPS



3.3.3 Horizontal scanning

Sync polarity : Positive or Negative
 Scanning frequency : 30 - 121 KHz
 Retrace time : 1.5 μ sec (typical)

3.3.4 Vertical scanning

Sync polarity : Positive or Negative
 Scanning frequency : 50 - 160 Hz

3.4 Power input connection

Power cord length : 1.5 M
 Power cord type : 3 leads detachable power cord with protective earth plug.

3.5 Video amplifiers

Rise time/Fall time : 4.0 / 4.5 ns
 (excluding rise/fall time due to test pattern & test probe)
 Overshoot/undershoot : Max. 12%
 Black level shift : Max. 3%
 Sag : Max. 5%

3.6 Degaussing

An automatic degaussing circuit is provided and required no intervention.
 The degaussing is activated at the time of switch-on and power saving
 wake up or switch-on again after switched-off for longer than 30 minutes.
 Manual degaussing is provided to eliminate any color impurity.

3.7 Requirement for low emission

(1) Electro static potential : $\leq \pm 0.5$ KV

(2) Alternating Elec. field

ELF 5 - 2 KHz : ≤ 10.0 V/M
 VLF 2 - 400 KHz : ≤ 1.0 V/M

(3) Magnetic field

ELF 5 - 2 KHz : ≤ 200 nT
 VLF 2 - 400 KHz : ≤ 25 nT

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Back

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3.8 Power management

The power consumption and the status indication of the set
 with power management function are as follows.

STATUS	Horizontal	Vertical	Power Spec	LED
On	Pulse	Pulse	as normal on	Green
Stand-by	No Pulse	Pulse	< 15 W	Yellow
Suspend	Pulse	No Pulse	< 15 W	Yellow
Power off	No Pulse	No Pulse	< 3 W	Amber

Entering from ON state to Power saving state must has 5
 - 10 second time delay. It must awake from Suspend
 state to On state within 3 seconds.

According to VESA power saving signalling,
 TCO99 power saving requirement
 EPA energy star requirement
 E2000

3.9 Display identification

In accordance with VESA Display Channel Standard V1.0 and
 having DDC 1 and DDC 2B capability

3.10 Customax (option)

The Customax provides the following control and adjustment
 capability, detailed please see the document "Software for your monitor".

- Screen geometry control: H-size, V-size, H-shift, V-shift, Tilt, Parallelogram, Trapezoid, Symmetry, Pincushion, background pattern, etc.
- Image quality control: Color temperature, etc.
- Monitor behavior control: Setting reset, Power saver, Color reset, etc.
- Information on current settings
- Preferences

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4.0 Visual characteristics

4.1 Test conditions

Unless otherwise specified, this specification is defined under the following conditions.

- (1) Input signal: As defined in 3.3, 1280 x 768 non-interlaced mode (68.7 KHz), signal sources must have 75 ohm output impedance.
- (2) Luminance setting: controls to be set to 20 ft - lb with full screen 100 % duty cycle white signal.
- (3) Warm up: more than 30 minutes after power on with signal supplied.
- (4) Ambient light: 400 - 600 lux.
- (5) Ambient temperature: 20 ± 5 °C
- (6) Ambient magnetic field: no special ambient magnetic field existed. (the ac leakage flux, dc flux caused by transformer magnet, etc.)
- (7) CRT face: East

4.2 Resolution

Inspection modes (9 modes) :

Mode	Resolution	H. freq. / V. freq	Standard
1.	1024 x 768	60.023KHz/75.029Hz	(VESA/75)
2.	1024 x 768	68.677KHz/84.997Hz	(VESA/85)
3.	1280 x 1024	79.976KHz/75.024Hz	(VESA/75)
4.	1280 x 1024	91.146KHz/85.024Hz	(VESA/85)
5.	1600 x 1200	93.75KHz/75.000Hz	(VESA/75)
6.	1600 x 1200	106.25KHz/85.000Hz	(VESA/85)
7.	1792 x 1344	106.3KHz/75.000Hz	(VESA/75)
8.	1920 x 1440	112.5KHz/75.000Hz	(VESA/75)
9.	2048 x 1536	120.5KHz/75.000Hz	(VESA/75)

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32

590

17

10

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Forward

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4.3 Brightness

Color Temp	Brightness control	Contrast control	White Square (see fig 5)	Full white
	CENTER	MIN		0 FL
6300°K	CENTER	MAX	32 FL	30 FL
6500°K	CENTER	MAX	30 FL	
5500°K	CENTER	MAX	28 FL	

- 4.4 Flagwaving: jitter less than 0.15 mm

4.5 Image size

4.5.1 Actual display size

The dimensions of the data area, measured along the picture center of horizontal and vertical axis of the screen, are listed below: (see Fig 1)

(392 ± 4 mm) X (294 ± 4 mm)

4.5.2 Max scan size

Maximum active video size should be not smaller than mask opening. The mask opening is 406.1 x 304.6 mm.

4.6 Image centering deviation

A-B and C-D : 6 mm, please see Fig 2

4.7 Picture shift range

H-shift range : total > 30 mm,
V-shift range : total > 15 mm.

4.8 Display dimension stability

Due to brightness : 1.0 %
Due to aging : 1.0 %
Due to mains voltage : 1.0 %
Dynamic : < 1mm

4.9 Geometric distortions

Pincushion, trapezoid, parallelogram, rotation and other various distortions must remain within the limits to tolerance as in Fig. 4.

top/ bottom/left/ right : 2.5 mm Max.
top plus bottom / left plus right : 3.5 mm Max.
waviness : 1.5mm/ 50mm Max.
slope change (Max) : one

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18

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Back

Forward

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- 4.10 Picture tilt
± 1mm (see Fig. 3)
User adjust range for tilt: 1 deg. min.

- 4.11 Image nonlinearity

Horizontal:

Max. - Min.

$\times 100\%$ ≤ 8% (30 - 31.5 KHz)

Max. + Min. ≤ 7% (31.5 - 64 KHz)

≤ 5% (64 - 121 KHz)

For any two adjacent blocks ≤ 5% (30 - 31.5 KHz)

≤ 4% (31.5 - 64 KHz)

≤ 3% (64 - 121 KHz)

Vertical: ≤ 5%

For any two adjacent blocks ≤ 3%

- 4.12 Misconvergence

The maximum convergence error should be measured on a white line and represents the maximum distance between the center of the red, green and blue lines over the whole image area.

Max. misconception: 0.15 mm in C zone (see Fig. 6)
0.30 mm in A zone
0.40 mm in B zone

- 4.13 Focus check

First, adjust brightness to 50 % position and contrast to max., and then generate "a" characters for 1024 lines to cover entire picture area (picture size is shown in sect. 4.5). Characters should be clearly identified at the center and all corners. Character size is shown in Fig. 7.

- 4.14 Brightness uniformity

With an active video area full white pattern adjusted to 30 - 32 foot lamberts, no portion of the pattern shall be less than 75 % of the luminance measured at the CRT center.

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Back

Forward

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- 4.15 White color adjustment

There are three factory preset white color 9300°K, 6500°K and 5500°K.

Apply full white pattern, with brightness in 50 % position and the contrast control at max. position.
The 1931 CIE Chromaticity (color triangle) diagram (x,y) coordinate for the screen center should be:

9300°K CIE coordinates X = 0.283 ± 0.020
Y = 0.297 ± 0.020

6500°K CIE coordinates X = 0.313 ± 0.020
Y = 0.329 ± 0.020

5500°K CIE coordinates X = 0.332 ± 0.020
Y = 0.347 ± 0.020

- 4.16 White uniformity

Set the brightness control at center 50 % position, then adjust the contrast control to set the luminance at the center of the screen being in the range of 30 - 32 ft-lb. The color coordinate at any point on the screen should be:
X = X (center) ± 0.015
Y = Y (center) ± 0.015

- 4.17 Color tracking on full white pattern

Adjust the contrast control from max. to min. (with brightness at click position). The color coordinates should not deviate more than:

x = x (center) ± 0.015

y = y (center) ± 0.015

- 4.18 Purity

Conditions: With full color pattern, with brightness control at 50 % position and contrast control in maximum, under the specific destinations of earth magnetic environments.

After a warm-up time of 30 min., the purity control can be used to eliminate colored stains if it occurs, the monitor should be well degaussed before purity adjustment.

Remark: If the external degaussing is used, the degaussing coil should be a stick type, can't use ring type for MITSUBISHI NF CRT.

To set the electrical current of four corner purity coils and N/S coil (if exist) equal to zero, or switch off the monitor before external degaussing.

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533 100 51424

Back

Forward

PHILIPS



5.0 Mechanical characteristics

5.1 Controls

Front side

- AC power switch
- OSD function key

Rear

- D-sub / BNC
- Power cord socket
- USB devices

5.2 Unit dimension / Weight

REF. TO SHEET 560

5.3 Tilt and swivel base

REF. TO SHEET 191

5.4 Transportation packages

REF. TO SHEET 560

6.0 Environmental characteristics

The following sections define the interference and susceptibility condition limits that might occur between external environment and the display device.

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Back

Forward

PHILIPS



6.1 Susceptibility of display to external environment

Operating

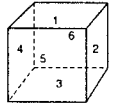
- Temperature : 0 to 35 degree C
- Humidity : 10 to 90% (w/o condensation)
- Altitude : 10,000 ft

Storage

- Temperature : -40 to 60 degree C
- Humidity : 5 to 95% (w/o condensation)
- Altitude : 40,000 ft
- Condensation : should be prevented

6.2 Transportation tests

A-Packed

Test	Standard reference	Philips severity	Remarks
Drop 1C-3E-6F	NSTA	Gross weight (Kg) 27.67-45.36 Drop height (cm) 30 For main land China : (Exclude local for local) Sequence: 1C-3E-6F-bottom Side: 30cm-bottom Side: 70cm-bottom Side: 30cm-bottom Side: 80cm-bottom, 14drops	4sets
Cold drop 40°C 16hrs, 1C-3F Recovery time after cold test +/- minutes	UN-D1400 Program2 Drop height - NSTA	UN-D1400 program2 Gross weight (Kg) 27.67-45.36 Drop height (cm) 30 Sequence: 1C-3F, 4drops 1set: C345F4-F5-F3, 1set: C261F2-F6-F	2sets ★ Only for reference 
Random vibration	Ref. ASTM D-4169	Truck spectrum, 0.73Grms, 30min/axis, 3axes Frequency(Hz): 5.350, 500 G/Hz: 0.001, 0.0001, 0.00005	2sets ◇ to simulate the actual transportation condition
Stacking	UN-D1400VIII Program2	Endure 7m stacking height, 20°C, 65%RH	2sets

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Back

Forward

PHILIPS

B: Nonpacked

Test	Standard reference	Philips severity	Remarks
Random vibration (operating)	--	0.25 Grms, 5-500Hz, 30min/axis, 3 axes. Frequency(Hz) 5,350,500G	2sets
Shock(half sine) (non-oper.)	--	100G-3ms, 6shocks ◇ CRT supplier spec is used to define maximum acceptable CRT fragility.	2sets ✱ Test failure exclude CRT impurity

6.3 Display disturbances from external environment
According to IEC 8012 for ESD disturbances

6.4 Display disturbances to external environment

6.4.1 Ionizing radiation
Completely fulfilled International Commission of Radiological Protection (ICRP) requirement 0.5 mR/hrs.

7.0 Reliability

7.1 Mean Time Between Failures
MTBF to be calculated according to military standard MIL-HDBK217C.
MTBF > = 75,000 hrs (excluding CRT)

Practition of MTBF : $\frac{\text{Total hrs (power on)} \times \text{Total sets}}{\text{NO. of failed sets}}$

8.0 Quality assurance requirements

8.1 Acceptance test according to MIL-STD-105D Control II level

AQL : 0.65 (major)
2.50 (minor)
(please also refer to annual quality agreement)
Customer acceptance criteria : UAW0377/00

9.0 Serviceability
The serviceability of this monitor should fulfill the requirements which are prescribed in UAW-0346 and must be checked with the check list UAT0361.

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Back

Forward

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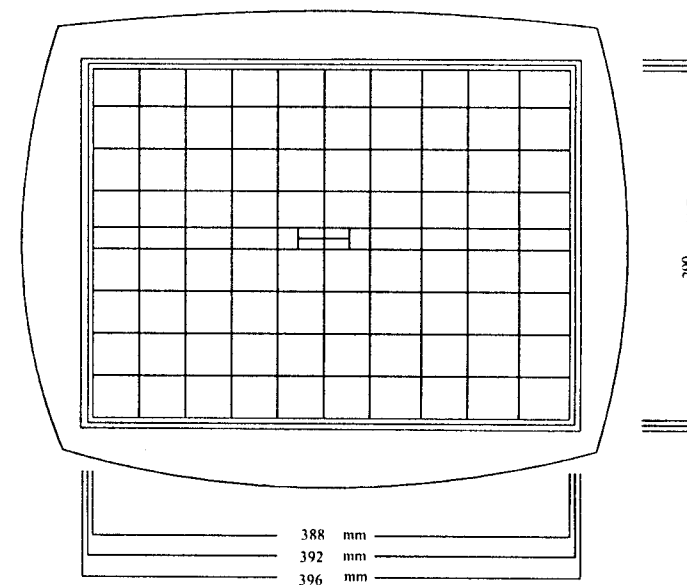


FIG-1 IMAGE DIMENSION

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Back

Forward

Go to cover page

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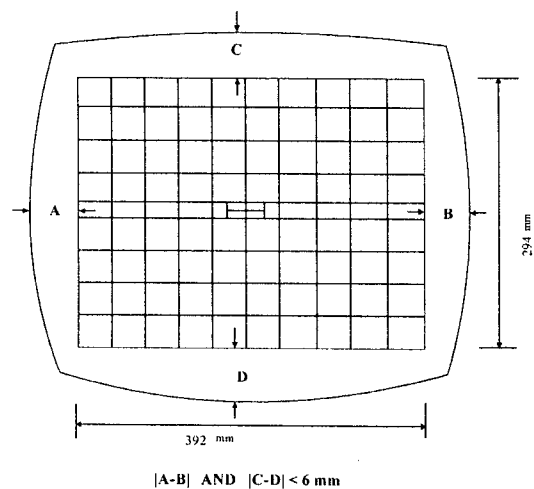


FIG-2 IMAGE CENTERING

CLASSIFICATION		21" AUTO SCAN CMTR-CM25+ 201P		8639 000 10329	
1999-12-10		TYPE : 201P 10/00			
TY		R.Y. CHOU		BRAND : PHILIPS	
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32		590		25	
10		A4			

Back

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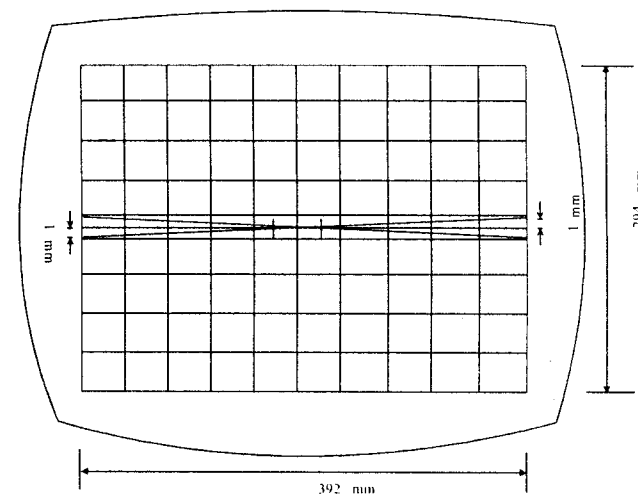


FIG-3 IMAGE ROTATION

CLASSIFICATION		21" AUTO SCAN CMTR-CM25+ 201P		8639 000 10329	
1999-12-10		TYPE : 201P 10/00			
TY		R.Y. CHOU		BRAND : PHILIPS	
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Back

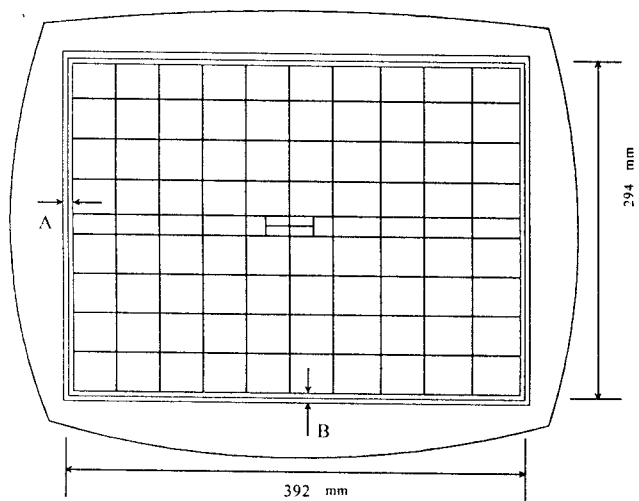
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$$A = B = 2.5 \text{ mm}$$

FIG-4 IMAGE GEOMETRY

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		TYPE : 201P 10/00			
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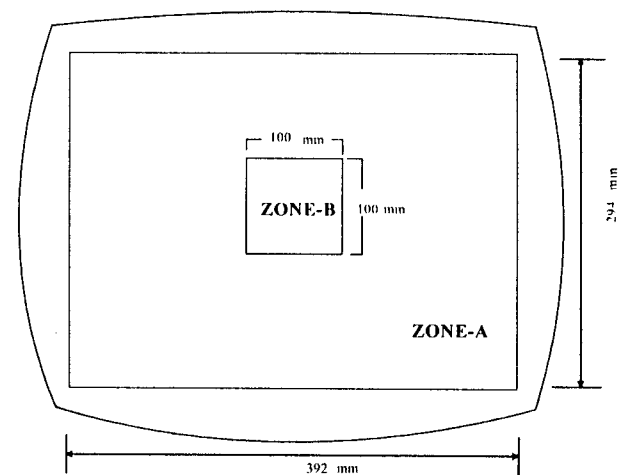


FIG-5 BRIGHTNESS AND CONTRAST MEASUREMENT AREA

CLASS NO.		21" AUTO SCAN CMTR-CM25+ 201P			
		TYPE : 201P 10/00			
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1013 100 55424

Back

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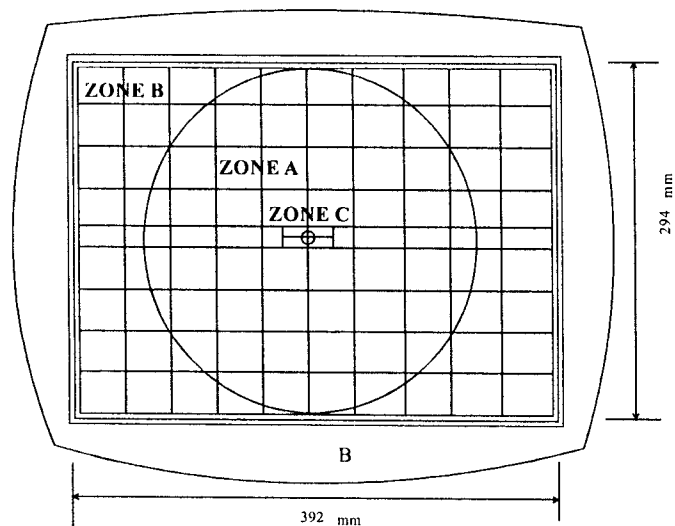


FIG-6 MISCONVERGENCE

1999-12-10		21" AUTO SCAN CMTR-CM25+ 201P		8639 000 10329	
NAME: R.Y. CHOU		TYPE: 201P 10/00			
TY		BRAND: PHILIPS			
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Back

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1 BYTE = 8BITS

LINE	HEX.DATA	7	6	5	4	3	2	1	0
0	0	0							
1	0	0							
2	3	C							
3	4	2							
4	4	2							
5	5	E							
6	5	2							
7	5	2							
8	5	C							
9	4	0							
A	3	C							
B	0	0							
C	0	0							
D	0	0							
E	0	0							
F	0	0							

Fig 7 CHARACTER FORMAT FOR FOCUS CHECK

1999-12-10		21" AUTO SCAN CMTR-CM25+ 201P		8639 000 10329	
NAME: R.Y. CHOU		TYPE: 201P 10/00			
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Back

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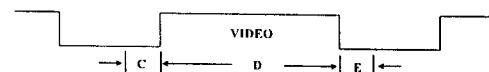
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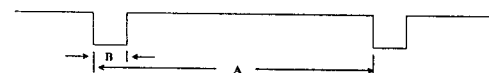


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SEPARATE SYNC.



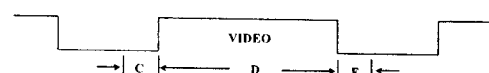
HORIZONTAL



VERTICAL



COMPOSITE SYNC.



HORIZONTAL

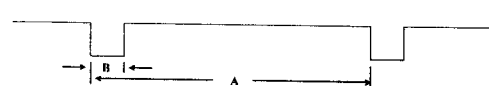


FIG-8 TIMING CHART-1

CLASS NO.		21" AUTO SCAN CMTR-CM25+ 201P		8639 000 10329	
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BRAND : PHILIPS					
NAME	R.Y. CHOU	SUPERS	32	590	31
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A4					

201P 100 GS3

Back

Forward

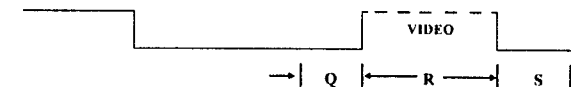
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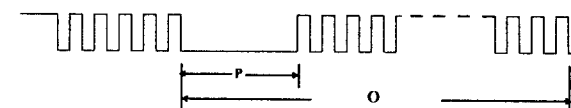


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VERTICAL

COMPOSITE SYNC. & VIDEO
(SYNC. ON GREEN)

HORIZONTAL



VERTICAL

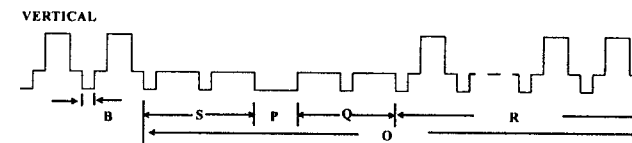
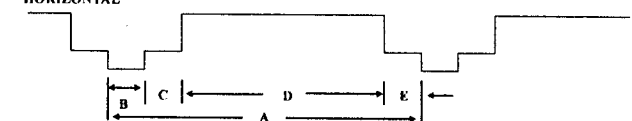


FIG-9 TIMING CHART-2

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1999-12-10		TYPE : 201P 10/00			
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NAME	R.Y. CHOU	SUPERS	32	590	32
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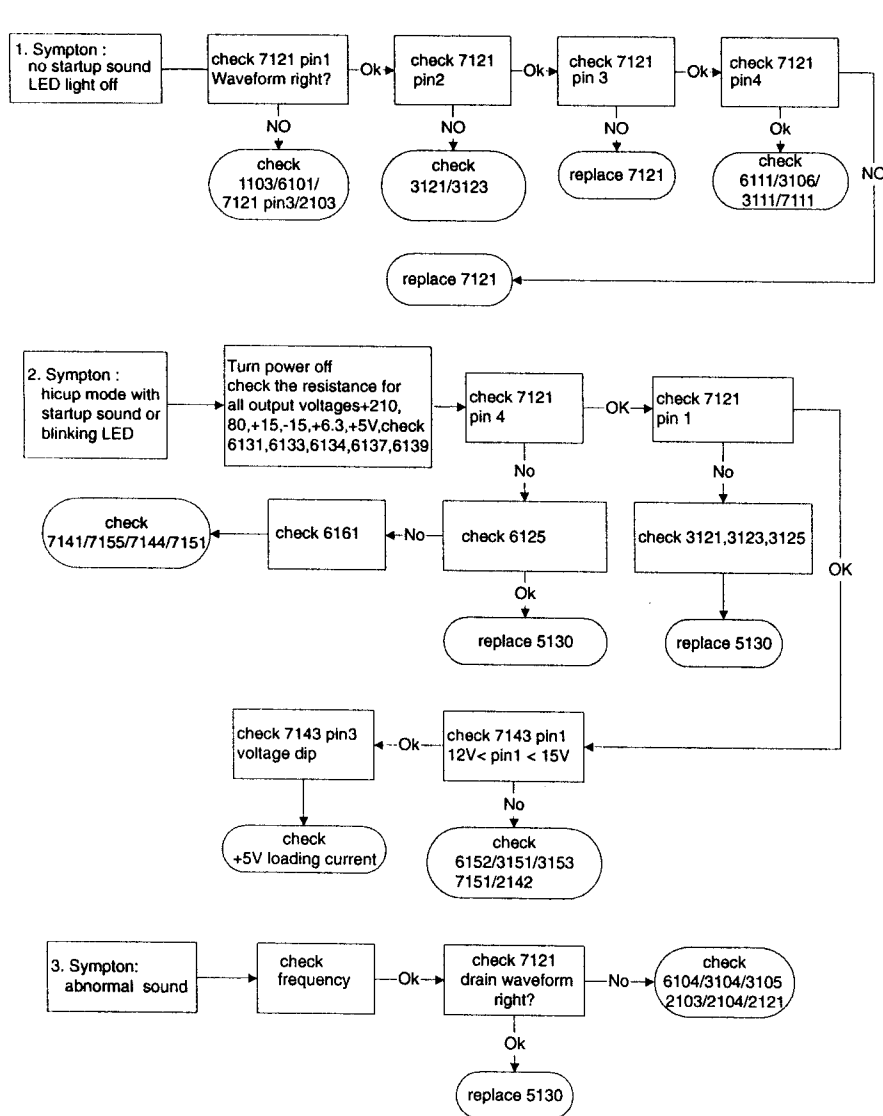
Back

Forward

Repair Flow Chart

◀ Go to cover page

A. Power Supply Failure

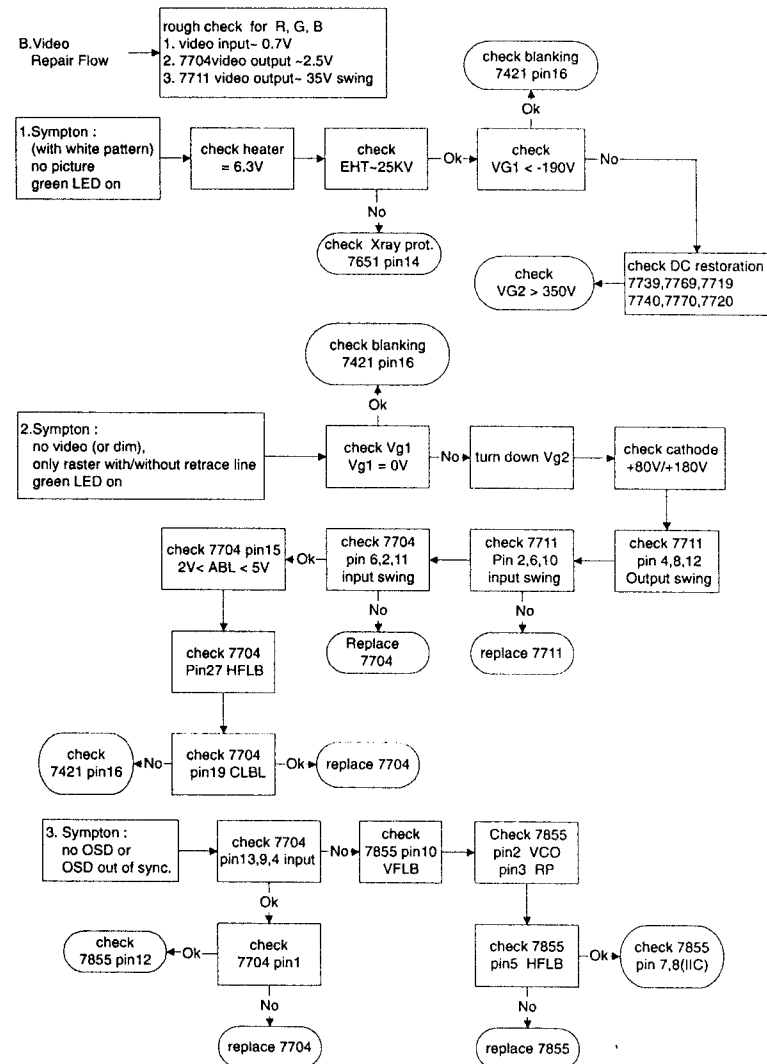


◀ Back

Forward ▶

Repair Flow Chart

◀ Go to cover page



◀ Back

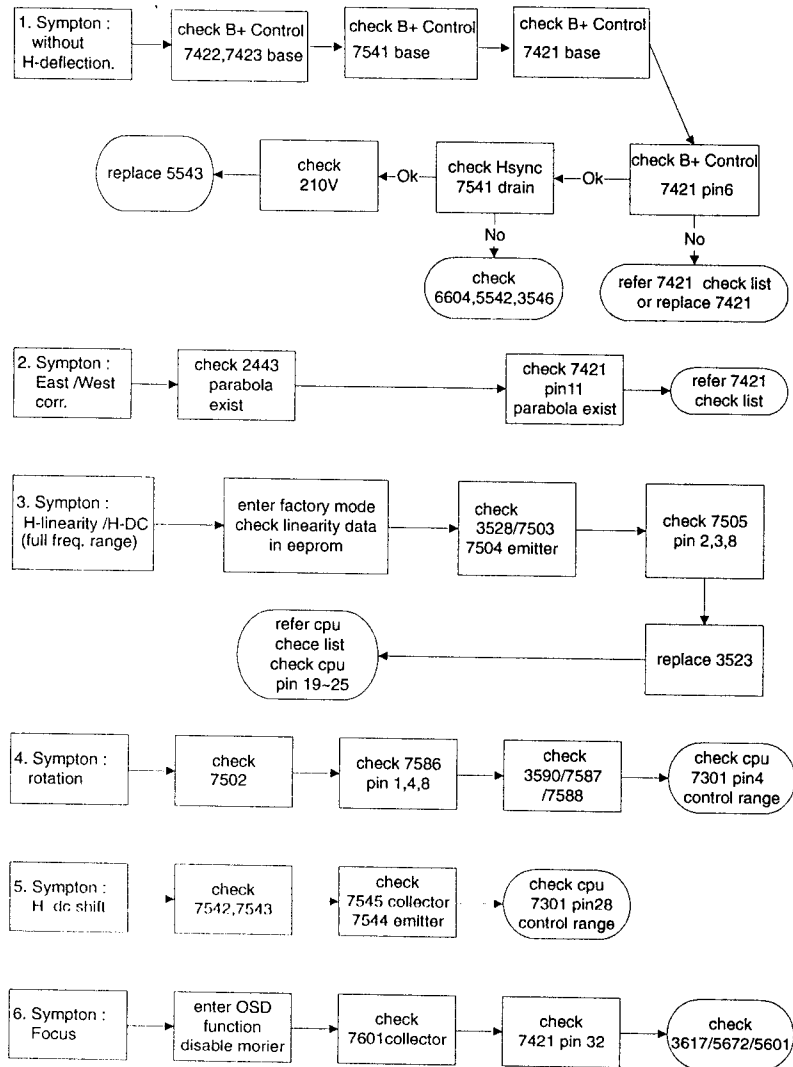
Forward ▶

Repair Flow Chart

◀ Go to cover page

C. Horizontal deflection

output repair flow :



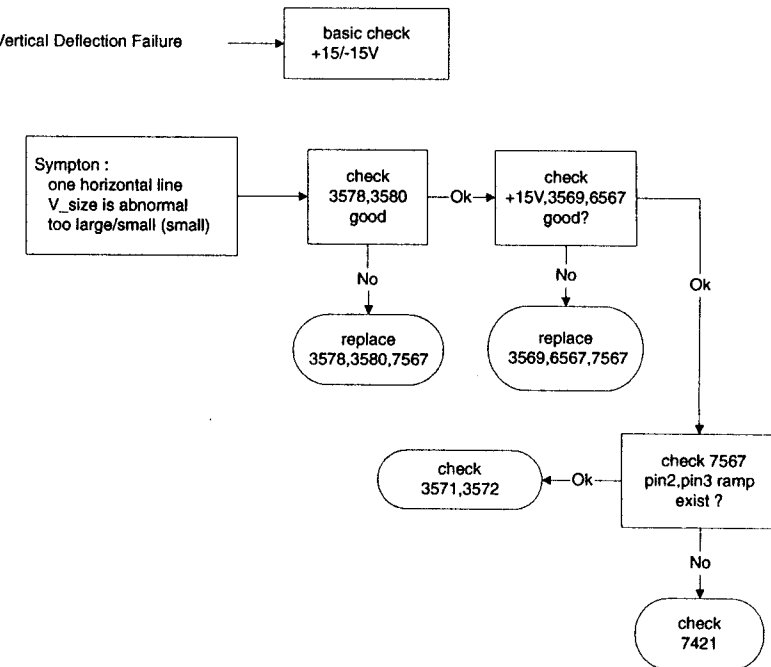
◀ Back

Forward ▶

Repair Flow Chart

◀ Go to cover page

D. Vertical Deflection Failure



◀ Back

Forward ▶

Repair Flow Chart

Go to cover page

E. CPU
check listBasic Check → check cpu pin11/pin32=5V
pin9/pin10=12MHz
pin12/pin31=gnd1. H-linearity → check pin42
pwm from 0V to 5V2. H-Centering → check pin28
pwm from 0V to 5V3. Blank → check pin2
normal : low
change timing : HiPin20~25 (S6~S1)
S-cap switch → check Q1~Q6
Pin20~25
low : 0
hi : 17. ABL-Adj → check pin29
pwm from 0V to 5V13,14,16,17
Hsync/Vsync → check sync.
hin=pin13
vin=pin16
hout=pin14
vout=pin17 → 1. Normal
Fvout=Fvin
2. sync out of rang
Fhin>121KHz
Fvin>160Hz18. Hunlock → check pin18
normal=Hi
blank=low6.7 P.S.
LED → check pin6/7 → normal pin7 pin6
standby hi hi
suspend low hi
off low low

Loc. Freq.(KHz)	Q4	Q5	Q4	Q3	Q2	Q1
~33.00	1	1	1	1	1	1
33.00~34.00	0	1	1	1	0	1
34.00~42.00	0	1	1	0	0	1
42.00~45.00	0	0	1	1	1	0
45.00~47.50	1	1	1	0	1	0
47.50~49.00	0	1	1	0	1	0
49.00~51.00	0	1	1	0	1	0
51.00~55.00	1	0	0	0	1	0
55.00~58.50	1	1	1	1	0	0
58.50~61.50	1	1	0	1	0	0
61.50~65.00	0	1	0	1	0	0
65.00~70.00	0	0	0	1	0	0
70.00~73.00	1	1	1	0	0	0
73.00~76.00	0	1	1	0	0	0
76.00~81.50	1	0	1	0	0	0
81.50~86.50	0	0	1	0	0	0
86.50~92.00	1	1	0	0	0	0
92.00~102.00	0	1	0	0	0	0
102.00~110.00	1	0	0	0	0	0
110.00	0	0	0	0	0	0

Back

Forward

Repair Flow Chart

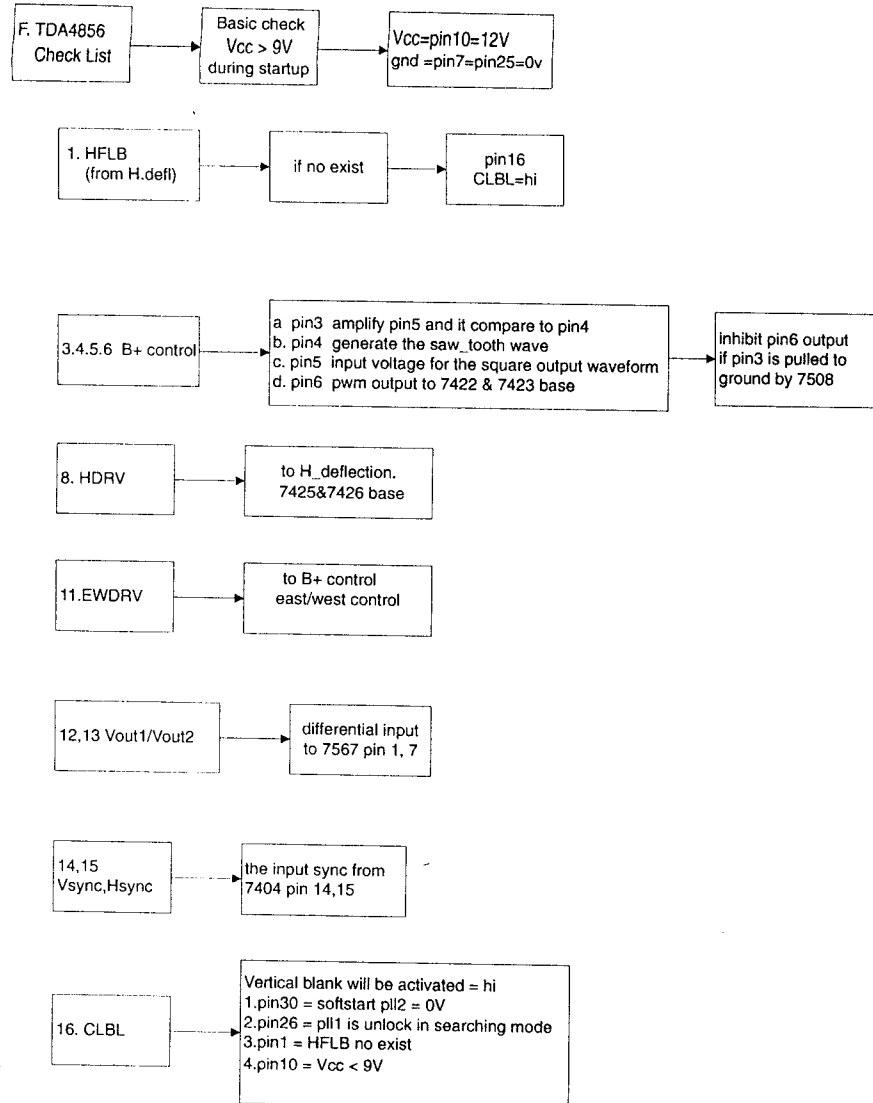
Go to cover page

1. Degauss → check
active=hi
no active=low26. Reset → check
from 5V to 0V → check
2317/6301
6302/332230. Brightness → check
pwm from 0V to 5V4. Rotation → check
pwm from 0V to 5V33. Keypad → check keys
ok,up,down,left,right → check 3319,
3891~3895Selftest → check pin34
1.no H/V sync & first power ON - show msg.
2.H/V sync exist - normal
3.H/V sync non-exist & after power ON - power saving
4.Left+Right Keys pressed with IFcable - factory mode
5.left +Right Keys pressed without IF cable - burn in mode36,37. DDC bus → check idle status
sda=pin36=hi
scl=pin37=hi38,39. IIC bus → check idle status
sda=pin38=hi
scl=pin39=hi → check
7336 M24C16
7421 TDA4856
7781 LSC4389
7701 TDA4886A40,41. EEPROM
write protection → check pin40 pin41
write : low low
read : don't care
normal : hi hi35. USB int → pin35
hi : active
low : no active

Back

Forward

Repair Flow Chart



Repair Flow Chart

